PENNSYLVANIA

Game News

MAY 1952

10 CENTS

THE STORY BEHIND THE COVER

ON June 22, 1931, the General Assembly of Pennsylvania approved the adoption of the ruffed grouse as the Commonwealth's state bird. It is hardly likely that any game bird has a more enthusiastic following than the ruffed grouse. Bird students and nature lovers admire his regal bearing and the quiet beauty of his plumage, hikers thrill to the throbbing beat of his drumming and gourmets declare his tasty flesh an epicurean delight. But of all his admirers the grouse hunters themselves seem to be most exuberant in their affection for Old Ruff, and this can readily be understood.

Without a doubt the ruffed grouse is one of the flashiest, trickiest bundle of feathers ever to dodge a load of shot and the taking of one of these birds furnishes a thrill even to those whose proficiency with the scattergun makes bagging a bird a not uncommon experience. Furthermore, Mr. Grouse is a wary creature with an uncanny sense of sight and hearing, and hunters find it practically impossible to approach him undiscovered.

If unpredictable behavior is the criterion Old Ruff really rates the title "King of Upland Game Birds." Sometimes he will flush wild, getting up out of sight of the gunner; at other times he allows the unsuspecting hunter to pass his hiding place, then flushes behind him with a thunderous roar. What that nerve-shattering performance does to a novice's shooting is legend. Furthermore, he seems to possess a sixth sense that tells him when a hunter is off guard, and takes particular delight in roaring out of hiding when his pursuer is thoroughly enmeshed in greenbrier, crawling over a log, or enjoying a noontime snack with an apple in one hand and a sandwich in the other.

In flight the grouse is at his best. His take-off is spontaneous and he seems to reach top speed almost immediately. A favorite trick is to put a tree between the hunter and himself, and when a tree isn't handy he'll duck around a clump of dead chestnut sprouts or a tangle of wild grape vines, or dive right through the nearest hemlock.

Grouse are notably difficult for a dog to handle. Certain dog breeders and trainers of the Keystone State have developed exceptionally fine, brainy dogs for this type of work and Pennsylvania grouse dogs are world famous. Old Ruff, himself, assuredly has brains aplenty or the present generation would be viewing their grouse through the glass front of a museum exhibit, rather than over the sights of a fast-swinging scattergun.

PENNSYLVANIA Game News

Published Monthly
(Semi-Monthly in September and March)

by the

Pennsylvania Game Commission

Vol. XXIII No. 2

Commonwealth of Pennsylvania

JOHN S. FINE, GOVERNOR

★

PENNSYLVANIA GAME COMMISSION

Robert Lamberton, *President* ....Franklin
John C. Herman, *Vice President* ..Dauphin
Ross L. Leffler .....Pittsburgh
Col. Nicholas Biddle .....Bethayres
G. I. Phillips .....Alexandria
Harold Moltz .....Williamsport
B. K. Williams .....East Stroudsburg
Joseph P. Willson .....Smethport

Thos. D. Frye
Executive Director

★

PENNSYLVANIA GAME NEWS

Will Johns ..... Editor on Military Leave
Ned Smith .....Acting Editor
Zelda Ross .....Circulation

CONTENTS

Beware of the Green Demons.. 4
By William C. Grimm

New Deal For Ducks 8
By Keith S. Schuyler

Know Your Binoculars 13
By R. J. and Elsa Reichert

Sportsman's Map of York County 31

Dandy Dogs 36
By Rutherford Montgomery

Some Pennsylvania Snakes
(An educational insert in full color)

★

Cover Painting
by
Ned Smith

HOW TO SUBSCRIBE

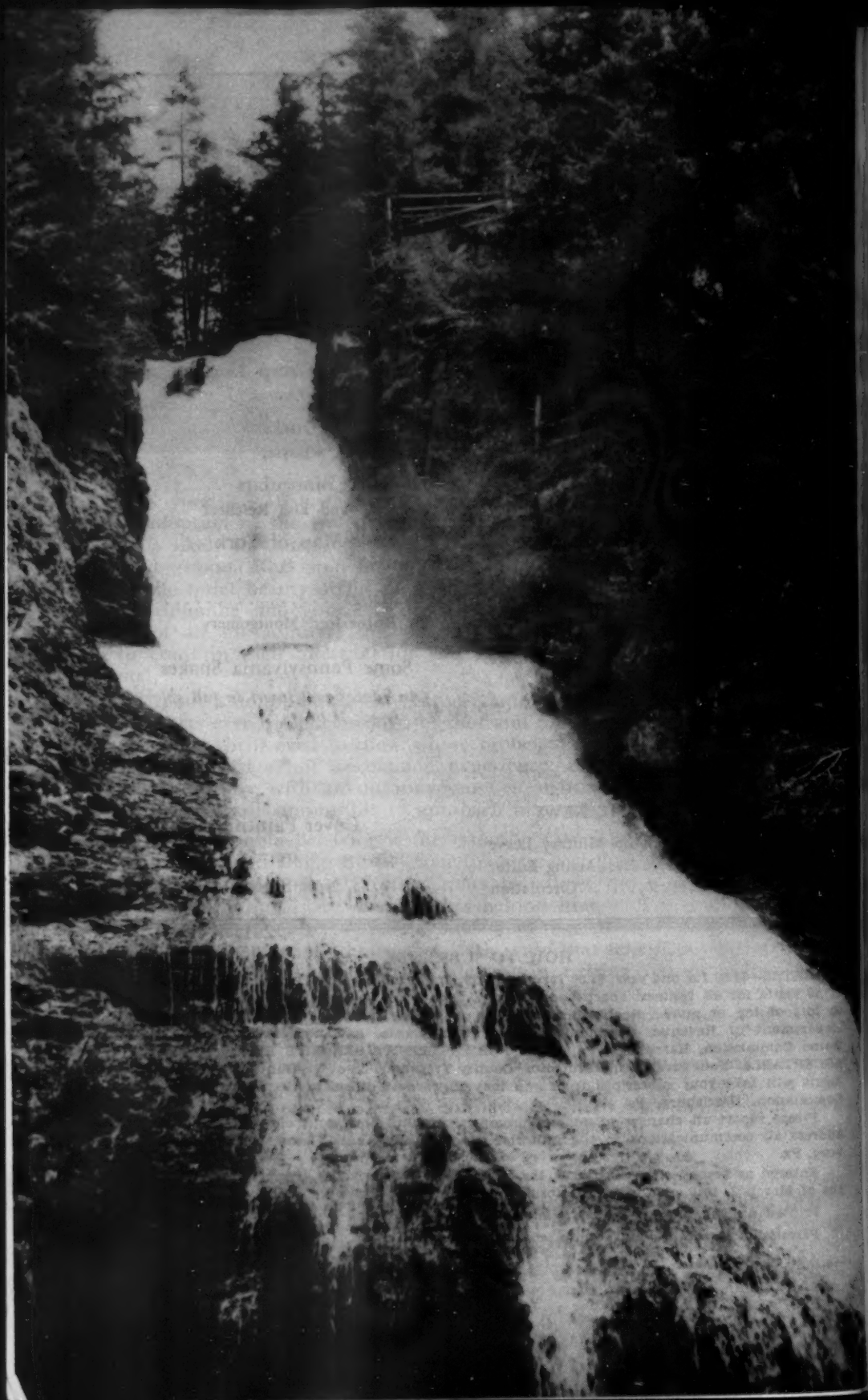
RATES—$1.00 for one year, $1.50 for two years, and $2.00 for three years, with a special rate of 50 cents for all resident sportsmen's organizations when such subscriptions are submitted in lots of ten or more. Remittance by check or money order to be made payable to the Department of Revenue, Commonwealth of Pennsylvania, and addressed to Pennsylvania Game Commission, Harrisburg, Pa. CASH FORWARDED AT SENDER'S RISK. STAMPS NOT ACCEPTABLE. Your local Game Protector, County Treasurer, or other Hunting License Issuing Agent will take your subscription; or you may forward it direct to the Pennsylvania Game Commission, Harrisburg, Pa.

Please report all changes of address promptly, sending both your old and new addresses. Address all communications to the Editorial Office, Pennsylvania Game Commission, Harrisburg, Pa.

Entered as second-class matter at the Post Office of Harrisburg, Pennsylvania, under the Act of March 3, 1879. Mailed in conformity with P. O. D. Order No. 19687.

Printed at The Telegraph Press, Harrisburg, Pa.

Permission to reprint will be granted provided proper credit is given.



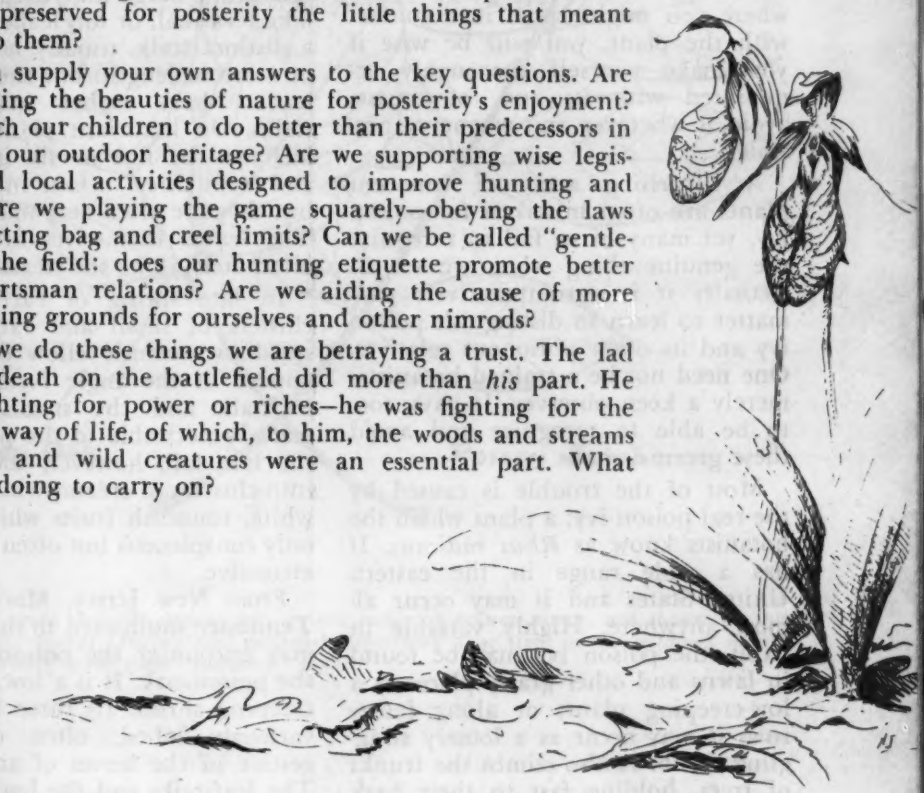
Editorial

ON THE thirtieth day of May America pauses to pay tribute to her war dead—to her heroic sons who laid down their lives that their fellow man might enjoy the freedom and independence that typifies our country. Parades are the order of the day; the stirring strains of band music and the tramp of marching feet are heard on every Main Street. Floral tributes are placed on flag-marked graves, and every citizen's heart is filled with gratitude for the sacrifice our boys have made. But is gratitude enough? Have we done our best to assure that this sacrifice was not made in vain?

To be sure, wars are waged to halt invasions, to escape oppression, to gain land or wealth. But to the average G. I. the important things are the *little* things, the simple, everyday pleasures that most Americans take for granted. Mom's home-cooking, the corner drug store where the gang hangs out, that merry stretch of trout stream that always produced a keeper or two, the hemlock-studded grouse cover back at the ridge, the eager setter patiently awaiting his master's return—*these* are the things that make a country worth fighting and dying for. Have our lads perished to save an America that doesn't live up to their expectations? Would they be pleased to see what we have done with the good old U.S.A. and its homespun charms? Have we preserved for posterity the little things that meant so much to them?

You can supply your own answers to the key questions. Are we protecting the beauties of nature for posterity's enjoyment? Do we teach our children to do better than their predecessors in caring for our outdoor heritage? Are we supporting wise legislation and local activities designed to improve hunting and fishing? Are we playing the game squarely—obeying the laws and respecting bag and creel limits? Can we be called "gentlemen" in the field: does our hunting etiquette promote better farmer-sportsman relations? Are we aiding the cause of more open hunting grounds for ourselves and other nimrods?

Unless we do these things we are betraying a trust. The lad who met death on the battlefield did more than *his* part. He wasn't fighting for power or riches—he was fighting for the American way of life, of which, to him, the woods and streams and fields and wild creatures were an essential part. What are YOU doing to carry on?



Beware of the Green Demons: Poison Ivy and its Kin

By William C. Grimm

MANY an otherwise pleasant summer outing, picnic or camping trip has ended unpleasantly because one or more of the participants contracted a bad case of ivy poisoning. One can't go very far afield without risking the possibility of getting a dose of the stuff. The plant may be growing in the vacant lot next door, or perhaps even in a remote corner of your own garden. It isn't necessary to take a lenghty excursion into the country in order to meet it. If you are an outdoor enthusiast, or you work where you might come into contact with the plant, you will be wise if you make yourself thoroughly acquainted with it; and, of course, avoid it wherever and whenever possible.

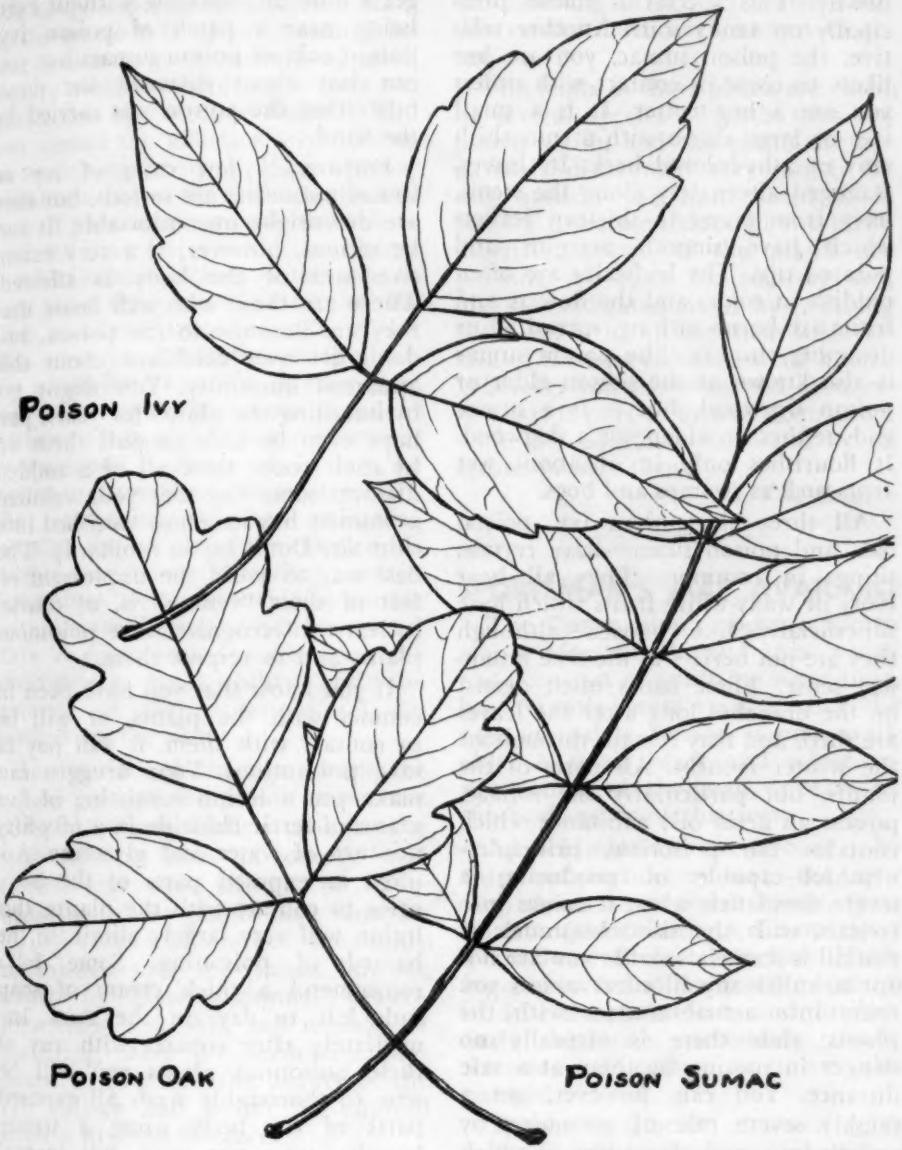
A surprising array of innocent plants are often mistaken for poison ivy, yet many of us fail to recognize the genuine thing when we see it. Actually it is a comparatively easy matter to learn to distinguish poison ivy and its other poisonous relatives. One need not be a trained botanist—merely a keen observer. It pays, too, to be able to recognize and avoid these green demons.

Most of the trouble is caused by the real poison ivy; a plant which the botanists know as *Rhus radicans*. It has a wide range in the eastern United States and it may occur almost anywhere. Highly variable in habit, the poison ivy may be found in lawns and other grassy places as a low-creeping plant; or along fencerows it may occur as a loosely straggling shrub. It also climbs the trunks of trees, holding fast to their bark with thousands of tenacious little aerial rootlets.

The leaves of the poison ivy are sufficiently characteristic to enable one to identify it at a glance. Each leaf is divided into three leaf-like portions which are known to botanists as "leaflets"; but the average person will call it "three-leaved." These leaflets are oval or somewhat egg-shaped in outline, pointed at the tip, and are more or less rounded at the base. Their margins usually have a few rather large and irregular teeth. The terminal, or top leaflet stands on a distinct stalk, usually half an inch or more in length; but the other two leaflets have rather inconspicuous stalks. On luxuriant plants the leaflets may be five or six inches long and from three to four inches across, but they are often very much smaller. The leaves themselves are scattered alternately along the stems.

In late spring or early summer, clusters of small and rather inconspicuous greenish-yellow flowers may appear in the angle formed by the leafstalk and the stem. They are scarcely noticable to the passerby. In the late fall, however, they develop into clusters of creamy-white or waxy-white, roundish fruits which are not only conspicuous but often downright attractive.

From New Jersey, Maryland, and Tennessee southward to the Gulf you may encounter the poison ivy's kin, the poison oak. It is a low, somewhat creeping shrub. Its three leaflets are variously lobed, often quite suggestive of the leaves of an oak tree. The leafstalks and the lower surfaces



The three green demons, poison ivy, poison oak and poison sumac, are shown in this drawing by the author. Anyone who anticipates spending some time in the outdoors should familiarize himself with these "nuisance" plants.

of the leaflets are densely velvety-downy. This species is found principally on sandy soils. Another relative, the poison sumac, you are less likely to come in contact with unless you are a bog-trotter. It is a small tree or large shrub with a smoothish gray or ashy-colored bark. Its leaves, arranged alternately along the stems, have from seven to thirteen leaflets which have smooth margins and pointed tips. The leafstalks are often reddish in color; and the flowers and fruits are borne in long, spreading or drooping clusters. The poison sumac is also known as the poison elder or poison dogwood, but it is a sumac and neither an elder nor a dogwood. It flourishes only in or about wet areas such as swamps and bogs.

All three—the poison ivy, poison oak, and poison sumac—have certain things in common. They all bear ivory or waxy-white fruits which look superficially like berries, although they are not berries in the true botanical sense. These fruits often persist on the branches long after the leaves are shed, and may remain throughout the winter months. All parts of the plants, but particularly the foliage, possess an acrid oily substance which contains the poisonous principle—urushiol—capable of producing a severe dermatitis when it comes into contact with the skin. Inasmuch as this oil is scarcely volatile you are not apt to suffer any ill effect unless you come into actual contact with the plants; thus there is virtually no danger in passing by them at a safe distance. You can, however, get a mighty severe case of poisoning by getting into smoke from fires in which the plants are being burned, for the smoke particles may be laden with the acrid poison. Remember this the next time you are burning brush, if any of these plants are mixed in it. The oily poisonous substance may also be transmitted on shoes or other articles of clothing, on tools, or on your pet dog if they have been in contact with the plants. Thus you might get a dose of poisoning without even being near a patch of poison ivy, poison oak, or poison sumac; but you can just about discount the possibility that the poison was carried by the wind.

Fortunately few cases of ivy or sumac poisoning are serious, but they are downright uncomfortable. It can be serious, however, if a very extensive area of the body is affected. There are those who will boast that they are immune to the poison, but don't get over confident about this apparent immunity. You might get by handling the plants for years, perhaps even be able to pull them up by their roots, then all of a sudden discover some day that your vaunted immunity has somehow vanished into thin air. Don't be so foolhardy. The best way to avoid the unpleasant effect of their "venom" is, of course, to learn to recognize these poisonous plants and to respect them.

If you know that you have been in contact with the plants, or will be in contact with them, it will pay to take precautions. Your druggist can make you a lotion consisting of five grams of ferric chloride in a fifty-fifty mixture of water and glycerine. Applied to exposed parts of the body prior to contact with the plants, this lotion will very largely eliminate the hazard of poisoning. Some folks recommend a thick cream of soap suds left to dry on the skin. Immediately after contact with any of these poisonous plants you will be wise to thoroughly wash all exposed parts of the body using a strong laundry soap—not once, but several times—and, if possible, follow this by bathing the skin with a good rubbing alcohol. If these precautions are taken soon after contact—not hours later—nine times out of ten you won't be a victim of the poison. Immunization by "shots" has been quite disappointing.

Now if you don't discover that you

have been in poison ivy—or poison oak or poison sumac—until the onset of the severe itching and burning, accompanied with the advent of small watery vesicles, there really isn't too much that can be done about it. You can spread the affliction by rubbing, or scratching, or by applying a greasy ointment. If you develop a really bad case of poisoning you will do well to seek the advice of your doctor. Phenolated calomine lotion, obtainable at any good drug store, is one of the best standard remedies. There are also other good remedies on the market which have a kaolin, or clay, base; but strictly avoid any greasy ointment no matter how highly its manufacturer recommends it. It would, in fact, be better to do nothing. In most persons the symptoms of ivy poisoning usually appear in from twelve to twenty-four hours following contact. Sometimes, however, they may appear within a few hours, or not for several days. A great deal depends upon the individual's susceptibility and the amount of the poisonous oil deposited on the skin.

In the fall of the year, both the poison ivy and the poison sumac are beautiful; their leaflets assume the most blazing hues of orange and scarlet, and with clusters of waxy-white fruits the plants look most alluring. Folks who are not thoroughly acquainted with the plants, but are struck by their autumnal beauty, sometimes make the sad mistake of gathering them for decorative purposes. In this case the beauty of the fall foliage had better be enjoyed from a discrete distance.

All three of these poisonous plants are members of the cashew family, another of whose members provides the delicious cashew nuts of commerce. They are also close kin to the red-fruited sumacs, none of which are in the least poisonous. One species, the Japanese varnish tree, which is very similar to our poison sumac, is the source of a black lacquer. Instances of poisoning due to the handling of articles coated with this varnish have been known to occur.

The fruits of these plants are eaten by several species of birds with apparent relish, and the plants are apparently distributed very largely by this agency; the hard-coated seeds passing unharmed through the bird's digestive system. If the plants are growing too close for comfort they may be eradicated either by grubbing them out or by killing them with certain of the new chemical weed killers. Whatever you do, be careful. Remember that it pays to be well acquainted with this poisonous trio—and by all means respect them.

. . . *The End.*

SPORTSMAN'S MAP AVAILABLE

The Commission's popular Sportsman's Map of Pennsylvania which has been out of print for some time, has recently been revised, and the new up-to-date version is now available. A small black and white reproduction of the map appears on the back cover of this issue.

Approximately twenty-four by thirty-six inches in size, the new map shows State Game Lands, State Forests, Game Refuges, Co-operative Farm-Game Projects, Archery Hunting Preserves and many other features of interest to hunters and anglers. State highways, secondary roads, streams and county lines are also marked.

Drawn to a scale of about 9 1/3 miles to the inch and embellished with a decorative border of wildlife portraits the map lends itself admirably to framing. Game Lands, State Forests, etc., are shown in color.

The Sportsman's maps are priced at fifteen cents each, and will be given free of charge with each subscription to GAME NEWS of *two or more years.*

SCS Photo by Edminster

From this seven acre wildlife pond, built in 1949 and rebuilt in 1950, seventy-two muskrats were trapped in 1951. At least three broods of wood ducks and two of blacks or mallards were raised on the pond this same year.

New Deal for Ducks

By Keith C. Schuyler

ON THE heels of the successful farm fish ponds that have delighted anglers and conservationists over the country, a relatively new idea is being developed which has a special appeal for the hunter-conservationist.

Wildlife ponds, the new development, holds the answer to many problems facing the man with the gun. But the biggest return will be in more ducks.

In addition to improving the sport of upland game shooting, wildlife ponds offer countless recreational by-products which include wildlife and wildlife cover, trapping, nature study and soil and water conservation. However, the greatest advantage to the hunter is in the production and attraction of waterfowl. This is particularly important to gunners in most parts of Pennsylvania who would like better duck shooting.

Sometimes referred to as wildlife marshes, the ponds offer many advantages to the farmer as well as to the sportsman. In New York State, where a program was instituted three years ago, and where ninety-two

ponds were built last year, game and conservation officials are enthusiastic over the results to date.

Wildlife ponds differ considerably from farm fish ponds in that depth of water is of little consideration, and fishing that is provided is only incidental to the general advantages. They differ, too, in size. Whereas a one-acre farm pond may be considered of good size, wildlife ponds are seldom less than two acres and have been constructed to encompass as many as thirty-five acres. Again, where farm ponds are constructed to discourage the growth of vegetation in deference to the fish the owner hopes to raise, wildlife pond bottoms are frequently cultivated to encourage the growth of food plants conducive to the propagation of waterfowl.

Selling the property owner on the establishment of wildlife ponds is not the chore today that it might have been twenty years ago. Diminishing water tables over the country, and the rising threat to areas where the table has remained fairly constant, makes addition of a pond of any nature of value to any property.

If constructed close to farm buildings, the pond offers fire protection by creating a readily available water supply. It provides water for stock throughout the year, and since vegetation is encouraged, the pond area provides refuge for upland game and a haven for waterfowl. Some owners have profited considerably from muskrat trapping.

Construction of a wildlife pond, or marsh, proceeds much as in construction of any type of dam, except that it is likely to be considerably less expensive. Selection of a site is important, since a natural basin can, of course, be dammed much cheaper than an area which requires extensive excavation.

Stripping of the topsoil and part of the subsoil from the dike site is important. The water control structure is then installed and a core of impervious clay is recommended along the entire center line of the proposed dike before the earth fill is added. A one-quarter inch to one-half inch hardware cloth apron should be buried about a foot beneath the sloping bank of the dike on the pond side and should be extended for about thirty feet on both sides of the headwall of the water control structure. This provides protection against muskrat tunneling.

Of course, the dike should be built a few feet higher than the proposed water level to guard against floods. An emergency spillway, always important in any dam, will handle normal flood waters and prevent the dike from washing out.

Before the dam area is flooded, it should be plowed or disced where possible to provide a seed bed for marsh plants.

As to cost, it is interesting to note that the average cost for twenty-seven small marshes built last summer in New York State was $271.

While the Pennsylvania Game Commission recognizes the construction of wildlife ponds as a worthwhile wildlife conservation practise, because of the demands of other phases of food and cover work it cannot at present include these ponds in its land utilization program. However, the Soil Conservation Service of the U. S. Department of Agriculture makes technical assistance available in soil and water conservation to farmer cooperators of locally-organized soil conservation districts, of which there are 28 in Pennsylvania. The Service furnishes technicians who work with farm owners to develop a complete soil and water conservation plan for the farm.

The Production and Marketing Administration of the U. S. Department of Agriculture has a branch known as the Agricultural Conservation Program. Their monies are appropriated to pay a portion of the costs of the installation of various

SCS Photos by Edminster

Site for shallow type impoundment to make a wildlife pond, now covered with sedges and some brush. Below—Laying tube for drop-inlet from concrete base.

soil conservation practices on farms. Assistance in paying for the construction of farm ponds that are designed to provide water for livestock management and irrigation is usually included in these programs.

However, although some financial assistance might be obtained, the relatively low cost of wildlife ponds in proportion to the benefits available makes such a project a good investment without such assistance.

Sportsman's clubs, which many times spend hard-earned money to stock game on lands which won't support it, might find concrete returns on their investment in a wildlife pond. If the club doesn't have land available, a cooperative project might be worked out with a farmer. In return for hunting and fishing privileges, the club could underwrite the cost of a pond for a farmer. The farmer, interested in land and water

that is still his property, would certainly serve as a constant guardian of the club's investment.

This writer has been advocating wildlife habitat improvement over indiscriminate stocking for a number of years. It simply does not make sense to expect game to reproduce where it has no natural protection from its enemies and an available food supply.

Our own Game Commission has been forced to adopt a program of stocking game immediately before and during the hunting season to meet the *demands* which exceed the supply of game that can be supported by the land in its present condition. This is done, of course, in the knowledge that hunters' guns will act as an equalizing factor.

An article of this length cannot be expected to provide all the information necessary for a reader to go right out and build a wildlife pond. (See notes at end for sources of such information) However, it is intended to create the desire for such a project. Although the preceding paragraphs were written with this intent, the burden of proof and necessity for the project rests with the writer.

So, let's look at it from purely an objective standpoint . . . on the basis of hunting alone, since this is the official organ of the Pennsylvania Game Commission. For a dissertation on wildlife ponds to deserve a place here, despite the other varied benefits they produce, we should be able to prove that wildlife ponds can and will improve hunting and its allied sport, trapping.

You have only to look back at the past hunting season and think where you found the most game after the first few days of the season. Almost invariably your memory will take you to a brushline stream or marsh. It is there that the ringnecks head almost as soon as the shooting begins.

Even the rabbits, though they often prefer to sit in the open fields, choose a spot near heavy cover or a groundhog hole. The few quail that we have left can usually be flushed from or near the heaviest thickets. But, it is not only the brushy thickets that attract the game, it is the constant supply of water in or near the thickets which assures animals and birds of a ready drink wihout exposing themselves.

Foxes are usually found in brushy areas because that is where they can most easily find the living creatures that form their diet.

And ducks . . . that brings us to the most important argument in favor of wildlife ponds. Pennsylvania long ago fell flat on its face with regard to duck shooting. Some recovery has been made in state propagation areas, but, generally speaking, the duck has gone with draining of the rearing areas by expanding civilization.

The one happy exception in regard to ducks has been in the recovery of the wood duck through erection of nesting boxes in a program sponsored by the Game Commission. But the relatively tame woodie cannot withstand the shooting to which he is subjected by duck hunters despite the limit of one duck a day.

So, if we are to have a return of good duck hunting to this state, we must do something about it. Cleaning of our refuse ridden and sewage saturated rivers will help, but establishment of semi-secluded rearing ponds will accomplish much more.

Once all states become "pond concious," return of good duck shooting everywhere is almost inevitable. And, the relief to the heavily hunted areas through spreading of the guns over a wider section of the country, will help to hold the slipping population of ducks that regularly tours the well-watered flyways.

Duckographically speaking, Penn-

sylvania is not on any of the principal migration routes. Our best duck shooting occurs when storms force waterfowl away from their scheduled routes or passing flocks descend because of storms or fog. Most of our best shooting, other than the "native" quackers and the relatively few ducks which normally migrate through the state, occurs when storms along the east coast force the flights inland from the main Atlantic flyway.

Native ducks are confined mostly to the colorful woodies, a few mallards and a scattering of blackies.

However, the nesting range of all winged creatures is adjusted to living conditions in the same manner as animals adjust their habits to food and cover. Both deer and beaver were extinct in some areas of this state only a comparatively few years ago. Yet both have increased almost to pest proportions in these same areas today.

If sportsmen and farmers of Pennsylvania concentrate on providing wildlife ponds, they won't have to search for wild residents to take over the natural homes that are provided.

Although wildlife ponds are relatively new on the conservation scene, early experience has shown the benefits possible. In one observation of six ponds, of which four had water in them for the first time in 1951, and two had water in them for two years, a counted total of 14 broods of wild ducks were raised and there were indications that six more were probably raised. Roughly, that is one brood for every two acres.

These ducks were blacks, mallards, blue-winged teal and wood ducks.

Since a conservative average for these species would indicate from 8 to 13 ducklings to a brood, the crop of ducks produced by the 40 adult ducks would be approximately 160 to 260.

Taking the average figure of 210 ducks, and estimating a survival of but 20 per cent after toll by predators, hunters and other causes, 42 ducks should survive. These ducks, produced from but 6 ponds, should reproduce at the very least 210 ducks the following year on the bases of five ducklings for each survivor from the original 210.

Although these figures are all hypothetical, with the exception of the 20 pairs of ducks that actually existed in the example given, I believe they are on the conservative side.

If you have read closely, you will see a net gain of but 10 ducks, after losses, over the first year. But, if this gain were multiplied by the building of but one wildlife pond in each of the state's 67 counties, on the basis of but 10 ducks to each six ponds, we would have a first year increase of 111 2/3 ducks.

You take it from there; I never did like mathematics.

However, if this doesn't sound like much, check back a few paragraphs. Remember, we allowed a mortality rate of 80 per cent. And, somewhere in that 80 per cent is a lot of good duck shooting. Of course, not all these ducks would be shot by state hunters, but if all neighboring states adopted the wildlife pond project, the shooting would be even better.

On the basis of ducks alone, I believe we have a good argument for wildlife ponds. The countless other advantages would be extra dividends in sport, recreation and CONSERVATION.

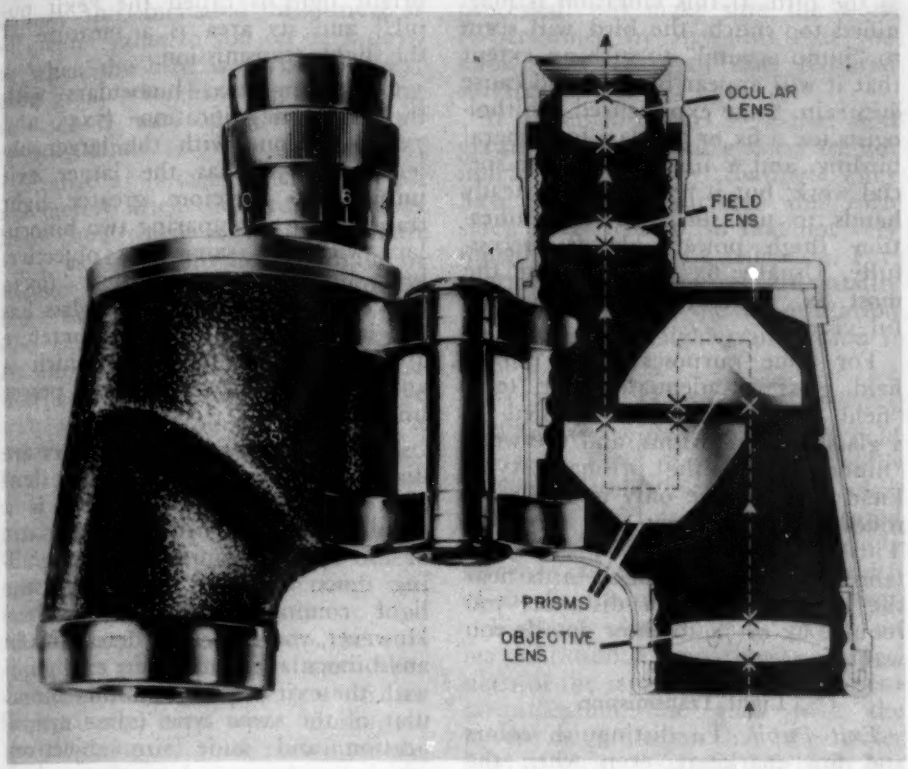
Those wishing additional information on wildlife ponds, may refer to the agencies below to whom I am indebted for much of the data upon which the preceding was based:

United States Department of Agriculture, Soil Conservation Service, Upper Darby, Pa.

Conservation Department, State of New York, Albany 1, New York.

Wildlife Management Institute, Washington, D. C.

. . . *The End*



Standard individual focusing prism binocular. "X's" mark the 10 optical surfaces where undesirable reflections occur. It is these surfaces that are coated to reduce reflection.

Know Your Binoculars

By Robert J. and Elsa Reichert*

ON ANY field trip you see birders using many different kinds of bird glasses, and sometimes you are surprised to find that the most expensive glass is not the one you prefer. Probably it is not the type that is best for you; or perhaps it is merely no longer functioning properly. To see the birds clearly—and that's why you're out birding—you need a glass that suits you personally, and is in good condition.

Magnification (Power)

Your binocular should "bring the birds up close," and show clearly details of markings and color. How close? A 6x glass magnifies 6 times: it makes a bird at 600 feet seem only 100 feet away; and one at 60 feet seem only 10 feet. An 8x glass brings them closer, and a 10x nearer still; but the bird may appear less clear. Any vibration of your hand holding the binocular is magnified as much

* This article was originally prepared by Robert J. and Elsa Reichert, of the Mirakel Repair Co. for *Audubon Magazine*. Permission to reprint has been granted by that magazine.

as the bird. If this vibration is magnified too much, the bird will seem to "jump around" to such an extent that it will appear blurred and cause eyestrain. Some experienced ornithologists use a 6x or 7x glass for general birding, and a 10x or more for special work; but it requires very steady hands to use such high magnification (high power) glasses successfully. Usually 6x or 7x, or at the most 8x, is recommended for restful vision.

For some purposes a low power field glass is adequate. The term "field glass" should be applied to a glass without prisms, and the word "binocular" to the prismatic type. Field glasses come only in low magnification, usually not over 4x or 5x. This is sufficient for very short distance observation, such as birds near the house; for longer distances you require 6x or 7x to show details you want to see.

Light Transmission

Exit Pupil. To distinguish colors and fine markings, even when the day is dark or the bird is in shadow, you also need good light transmission. You want a glass that lets through a good deal of light. Some glasses let through much more than others. Light enters the binocular through the objective lens—the "window" of the binocular—and naturally a large objective lens lets in more light than a small one. The size of the objective (its diameter) expressed in millimeters (mm.) is the second numeral used to describe a binocular. A 7x35 has a 50-mm. objective, which being much larger, therefore lets in a great deal more light. You can check the light transmission of a binocular quite easily: hold the binocular 8 to 10 inches from your eyes, pointed towards the sky, and look at one of the ocular lenses. In the center you will see a circle of bright light—the cross-section of the beam of light coming out of the binocular. This circle of bright light is called the "exit pupil," and its area is a measure of the light transmission.

Comparing two binoculars with the same magnification (7x35 and 7x50), the one with the larger objective (7x50) has the larger exit pupil, and therefore greater light transmission. Comparing two binoculars with the same size objective, but different magnification (6x30 and 8x30), the lower power glass has the larger exit pupil, and therefore greater light transmission, which is another reason for using low power binoculars.

Unfortunately some binoculars are dishonestly built. The objective lens may be large, but behind it is a diaphragm that cuts down the size of the opening, much the way pulling down a shade cuts down the light coming through a window. However, you can easily detect this in any binocular: compare its exit pupil with the exit pupil in another binocular of the same type (same magnification and same size objective), which you know is honestly marked.

Coating. Before the war the size of the exit pupil was all you needed to know about the light transmission of a binocular. Today there is another factor: its brightness. After the light enters the objective, it passes through various lenses and prisms, and a good deal is "lost" by reflection from the surfaces of these glass parts. At each surface the loss is about 5 per cent, and as there are at least 10 such surfaces (on each side of a binocular), the total loss is considerable.

Science has now found a way to prevent so great a loss by means of a new process called *coating* (or *hard-coating*). The glass surfaces are treated to reduce the reflection of light to only about ½ per cent (instead of 5 per cent) per surface. Much more light gets through the binocular—about 50 per cent more if all the required surfaces are coated. Of

course, this increased brightness is of greater value to you on dark days, or when the bird is in the shadow; then greater brightness means seeing colors and markings clearly instead of only dimly.

Strange as it seems, coating helps, not merely when the bird is in poor light, but when it is in brilliant light as well, but for a different reason. When the bird is in bright light, or silhouetted against a bright sky, the multiple reflections inside an uncoated binocular cause a glare that tends to blur vision. You've seen such blurring of vision in a store window when sunlight reflected from the window makes it impossible to see clearly the display behind the window. Much the same thing happens in a binocular, except that instead of two reflecting surfaces you have many more—at least 10. Coating these surfaces, because it reduces the reflections until they are negligible, enables you to see birds clearly, even when looking in the direction of, but not into, the sun.

So greatly does coating increase the clarity of vision of a binocular—both in dim and in very bright light—that all modern high-grade binoculars come with coated optics. Some of the less expensive glasses that call themselves "coated" have only a few —not all—of the surfaces processed, but even this is a help. How can you tell whether a binocular has coated optics? Look at the objective lenses: if they have a bluish or purplish tinge, they are coated. If you have any doubt, compare them with uncoated lenses; their appearance is quite different. However, this only tells you that the objectives are coated; you have no way of knowing how many of the inner surfaces of the binocular are coated.

Fortunately, you need not buy a new binocular to have a coated glass. If you own an uncoated one, you can have the lenses and prisms processed; but make sure the work is performed by an outfit that you know will coat all the required surfaces.

It is well to remark here that field glasses (non-prismatic glasses) are not much improved by coating. They have only four surfaces (on each side), instead of 10, so that not very much light is lost by reflection. Furthermore, the objectives are usually large enough and the magnification low, so that the light transmission is high.

Field of View

When watching birds, a wide field is a help. Field of view is the width of scene visible through a binocular. Width of field is usually measured at a standard distance from the observer—1,000 yards away. The width of the field is usually quoted in feet.

Field of view depends partly on magnification: Comparing two binoculars of the same design and different magnification, the glass with the lower magnification has the wider field of view. A standard field 8x has a field of about 330 feet, and a standard field 6x a field of 445 feet. There are 8x binoculars with a 445-foot field; these are wide field glasses and differently designed. The part of a binocular that determines whether it is a standard field or wide field instrument is the ocular system —especially the field lens. In a standard field binocular, the ocular system consists of only two lenses, one of them a small field lens. In a wide field binocular, the ocular system is complex, consisting of three lenses, one of them a large field lens. This complex design is costly to make, and that is why true wide field binoculars are usually high-priced.

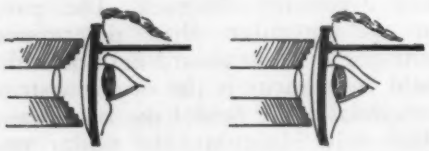
We say "true" wide field, because there is much false advertising on this subject. Most low-price binoculars are called "wide field," although the field is only standard. How can you tell whether a binocular has a wide field? One way is to get this

specification when you buy a glass—the number of feet seen at 1,000 yards—and compare it with the figures shown in the table. Another is to compare the binocular with a glass of the same magnification and known field of view. Look at something that is easily measured, such as a distant building with many windows, and count how many windows you see through each glass.

You may come across an untrue claim about field of view often found in ads. As above explained, the width of the field is determined by the size of the field lens. The objective lens has no effect whatever on field of view, and any claim that a large objective produces wide field is wholly false. A large objective, as previously mentioned, lets a great deal of light into the binocular, and that is its only advantage.

Field of View and Eyeglasses

If you wear eyeglasses you have a special problem as regards field of view. Binoculars are designed for use without eyeglasses. When you hold the binocular so that the eyecaps



Normal binocular eyecap when used with eyeglasses (left) holds eye too far away from ocular lens for maximum field of view. Shallow eyecap (right) positions the eye at the proper distance.

are close to your eyes, as is normally done when no eyeglesses are worn, you get the maximum field obtainable with that particular binocular. If, however, you hold it so that the eyecaps are further from your eyes, as happens when you wear eyeglasses, then you get an appreciable smaller field of view. It is not practical to take off your eyeglasses every time you use your binocular; there is a better solution. Eyecaps are usually deep so that the ocular lenses are about 11 mm. from your eyes when you use the binocular without eyeglasses. They can be made shallow (flat), so that when you use the binocular with eyeglasses, the ocular lenses are close up against your eyeglasses—and about the correct distance from your eyes for maximum field of view. The increase in field thus obtained is quite surprising.

Choice of Models

It is in the matter of field of view that a field glass is notably less satisfactory than a prism binocular. Although the magnification is only 4x or 5x, the field is considerably less than in a 6x binocular. That is why, apart from reasons of economy, the field glass is seldom chosen except for work at very close distances. It is somewhat easier to use than a binocular, and for that reason as well as its lower cost, it is particularly suitable for children.

When selecting a binocular, bear in mind that there is no binocular made, irrespective of price, that is ideal for all purposes. So you must decide what features are most important to you. If you are going to watch birds mostly under very dark conditions, such as at dawn or dusk or in deep shadow, then you need the 7x50 with its very large objectives—of course, with coated lenses and prisms. Its tremendous light transmission makes this model a must for work under such extremely unfavorable light conditions. To be sure, this glass is large and bulky—large objectives mean large prisms and large overall size. If smallness and compactness mean more to you than brightness, then you may pick a pocket binocular, which necessarily has small objectives. You may compromise on a 6x, 7x or perhaps an

8x binocular, with objectives not less than 30 mm. No matter what model you decide on, you naturally prefer it to have coated optics.

As for field of view, the standard field 6x has all the field you need for bird study; the 7x, of course, has somewhat less. A disadvantage of standard field in 8x and 9x binoculars is their small field. If you want such magnification, you will undoubtedly choose wide field models, if you can afford them. Before deciding on any binocular, it pays to try it out on a birding trip, and if possible compare it with other glasses, to make sure it really suits your personal needs.

It is truly a joy to use a binocular when you can "pick up" a bird quickly, and see colors and details clearly—and without eyestrain. For such vision you must use the glass correctly, it must be the right mechanical type, and above all, it must be in good condition.

Only you can focus the binocular for your own eyes, and you should do so carefully before you leave on a bird trip. To focus, you need a printed sign to look at. Select one at least a couple of blocks away. For best results, rest your elbows on something solid, then depending on which mechanical type of binocular you are using, proceed as follows:

Individual Eyepiece Focusing

This type has two calibrated eyepieces that are focused separately. First, turn both eyepieces as far out as they will go. Next put the binocular to your eyes, close your right eye, and look at the sign through the left side, turning the left eye piece until you can read the print clearly. Use the same method to focus the right side. Then bend the hinge adjustment until your eyes look through the center of each ocular lens. Note carefully the marking where each eyepiece is set so that, if it is moved, you can put it back in correct position without looking through the binocular.

Your binocular is now correctly focused for the sign, and also for objects moderately close to you. How close you can see clearly depends on two factors: the magnification of the binocular and the condition of your eyes. The lower the magnification, the closer you can see clearly without changing the setting of the eyepieces. Eyes vary greatly in their ability to see close up, one's age being the chief factor. Your eyes can "accommodate" for near vision; as you grow older your eyes gradually lose this ability. When looking through your binocular at a near object, if it looks blurred, turn the eyepieces, as already described, until you see clearly.

This type has a focusing wheel on the hinge post, and a calibrated right eyepiece. The left eyepiece is not adjustable. First turn the focusing wheel until the bridge supporting the two eyepieces is as far out as it will go, and turn the right eyepiece as far out as possible. Next, put the binocular to your eyes, close your right eye, and look at the sign through the left side turning the center focusing wheel until you can read the print clearly. Then close your left eye, and turn the right eyepiece until you read the print clearly. Bend the hinge adjustment until your eyes look through the center of each ocular lens. Note the marking where the right eyepiece is set, so that if it is moved, you can put it back into correct position without looking through the binocular.

When looking at a near object, if it appears blurred, refocus as follows: keep both eyes open, and turn the center focusing wheel until you see the object clearly. Do not move the right eyepiece, as once you have set it correctly, it is correct for all objects, far or near. In fact, if you and you alone are going to use your

binocular, it might be a good idea to fasten the right eyepiece in place with a bit of Scotch tape.

Advantages of Each Type of Focusing Mechanism

Individual Focusing. Once you have set the eyepieces correctly for your eyes, they are correct for all reasonable distances—from the far distances to as close as 50 to 30 feet. If you never look at nearer objects, this is the type of focusing mechanism for you. Once you have set the eyepieces, they are set for life, and you can fasten them in place with Scotch tape. If you watch birds as close as 25 or only 15 feet, you will find this type inconvenient. Refocusing each eyepiece separately is slow.

The individual focusing mechanism can be fairly well sealed, so that moisture and dust do not easily get into the binocular. That is why the hunter—who never observes objects closer than 50 feet and values durability—prefers this type. Military binoculars, which must take a heavy beating in all kinds of climate and weather, are always individual focusing.

For observing close-up birds as well as those far away, use this type of binocular. Before you leave on a bird trip, make sure the right eyepiece is set correctly; then all you need to do to see birds clearly—whether far or near—is turn the center focusing wheel. Thus you can follow moving birds easily.

How close you can focus your binocular depends on several factors. Generally speaking, you can focus nearer with a low power binocular than with one of higher magnification, but instruments vary considerably. You may even find that one binocular can be focused closer than another glass of the same model and made in the same factory. If you have a choice, pick the glass that focuses closer.

As for sealing against moisture and dust, this cannot be done effectively with center focusing construction. The ocular tubes slide up and down, and must necessarily fit fairly loose or they would jam; certainly they cannot be sealed. And advertisement claiming central focusing glasses to be "sealed" or "waterproofed" is obviously false.

In the focusing instructions above outlined we assumed that if you see clearly through each side of a binocular separately, you can also see clearly through both sides at the same time. This is true only when the two sides are perfectly aligned. If the binocular is "out of alignment," one side points at a somewhat different spot than the other. Looking at two different views at the same time puts an unreasonable burden on your eyes. If the difference is great, you will find it impossible—you will not even try—and so will suffer no eyestrain.

But, if the difference is slight, your eyes will attempt to fuse the two different images. This produces various effects. The object you look look at may appear blurred. It may appear to flicker, as one or the other eye tires from the strain and stops seeing the object. Eyestrain is certain and a headache may result.

Correct alignment is essential for clear and restful vision, and if your binocular is not easy on your eyes, it should be checked for alignment. If you cannot do this yourself, send it to an organization qualified to check it, and to align it accurately if needed. To achieve precision alignment—whether in factory or repair shop—a special instrument known as a "collimator" must be used and the reason for its use is a curious one.

Bear in mind the hinge adjustment of a binocular. When it is bent closed, the eyepieces are close together, in position for eyes that are close together; when the hinge is

wide open, it is set for eyes that are far apart. A binocular should be in correct alignment for all hinge positions–correct for all eyes. To achieve correct alignment for all hinge positions a precision testing instrument is absolutely necessary. A practiced aligner can easily align a binocular "by eye" alone for any one position of the hinge, but he cannot do so for all positions. To accomplish this he must use a collimator, and it must be properly designed and very accurately built.

Few people realize how many new binoculars are more or less out of alignment when offered for sale. Perhaps the factory collimator was not well designed or not accurately made, or perhaps the aligner was careless. Possibly some optical or mechanical part in the binocular shook loose during shipment, and this caused misalignment. When buying a binocular, check it for alignment if you can; if not, and you have any doubt, have it checked. For to you, as a bird watcher, precision alignment is especially important. You often look through your binocular continuously for long periods at a time; a poorly aligned glass causes eyestrain–restful vision is for you indispensable.

Of course, you should make sure your binocular stays in alignment. It should be checked from time to time. When sending it for realignment, make sure the people to whom you send it have a precision collimator.

Clean Optics

A binocular may be correctly focused for your eyes, and in perfect alignment, and yet may not give you clear vision. The lenses and prisms may have become dirty. You cannot see clearly through a dirty window, which has only two surfaces on which dirt has settled. A binocular has at least 10 glass surfaces (on each side); if dirt or moisture has settled on them, vision is more or less obscured.

This is easily checked: hold the binocular about 10 inches from your eyes, in reverse position, with the ocular lenses away from you and pointed towards the sky. Look into the binocular, not through it. You will plainly see any dirt that may be on the inside optical surfaces.

Proper Handling and Care

Cleaning. Keep your binocular clean. Wipe off any dirt on the metal parts, especially the sliding ocular tubes and adjustable eyepiece, so grit does not get into these moving parts and cause wear. When cleaning the lenses, be careful not to scratch them. Dust particles are harder than a glass surface, and should not be rubbed into it. So, before wiping, blow off all the dust you can. For wiping use a perfectly clean linen handkerchief, or a new cleaning tissue; never use either more than once. To remove stains and smears, breathe a film of moisture on the lens; or put a couple of drops of alcohol on the wiper. When your binocular is not in use, keep it in its case away from dust or moisture.

Never attempt to take your binocular apart to clean it inside. This is a job for an expert, properly equipped, because cleaning necessitates realigning. If your binocular is not coated, this is the most economic time–when it is taken apart for cleaning–to have it coated. Be sure, however, that the people doing the work can be relied upon to coat all the lenses and prism surfaces that should be processed, for you cannot check the inside ones yourself. Your binocular's increased light transmission from a combined cleaning and coating job will astonish you.

Maintaining Alignment

For a binocular to be in perfect alignment, all the mechanical and optical parts must be in precisely the correct position. The displacement of

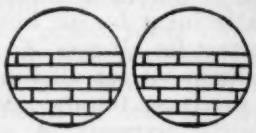
almost any part, even if only slight, will affect the alignment. Don't bump or jar your glass; never throw it down, even when in its leather case. When you wear it around your neck, keep it from bouncing around. Especially when climbing, it is wise to button your coat or shirt around the binocular, to prevent bumping into rocks or trees. A binocular is a finely adjusted scientific instrument; only if treated as one will it serve you well.

Relative Importance

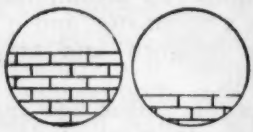
Your binocular can bring the birds up close, and show them distinctly, without being an expensive instrument. You can obtain the magnification you need for general use—6x to 8x—at a moderate price.

With a magnification not over 6x or 7x, you will find the standard field of view ample; in fact, wide field is rarely made for these magnifications. With an 8x, or higher, a field wider than standard is helpful, both for locating the bird quickly, and in keeping it within your vision during flight, but wide field is expensive. It is a pleasant luxury, but it has no effect on clarity—your prime consideration.

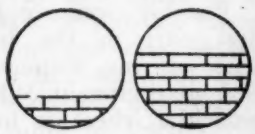
Good light transmission is worth paying for, if you can afford it. It helps you see colors more clearly under dim lighting conditions. You can obtain high light transmission by very big objective lenses, but this means an inconveniently large and bulky binocular. A better way is by objectives of moderate size, and coated lenses and prisms. With coated optics, objectives of 30 mm. to 35mm. will transmit all the light you need for any daytime use. The darker the day, the deeper the shadow on the bird, the more you will appreciate the increased light transmission due to coating. But you can get along quite nicely without coated optics under the usual daylight conditions.



When the view seen through the left side of a binocular is the same as the view seen through the right side, the glass is in alignment.



When the view seen through the left side of a binocular is different from the view seen through the right side (see above and below) the glass is out of alignment.



To check your binocular for alignment, look through it at a horizontal building top. Draw the binocular slowly away from you until the ocular lenses are about 10 inches from your eyes. While doing this keep your eyes absolutely rigid, your left eye continuing to stare through the left side, your right eye staring through the right side. You will then see *two separate* views, next to each other, and can compare them.

The one indispensable requirement of your glass—whether you have a $200 prism binocular or a $20 field glass—is good condition. Your glass should be optically clean and, above all, in perfect alignment. Only then will it give you the clear and restful vision so essential for happy birding.

. . . *The End.*

Outdoor Kids

By Hal H. Harrison

BILLY and Jane know tent caterpillars best when they come out of their egg masses in early spring and build their large white "tents" in the crotches of wild cherry trees.

From the moment they hatch, tent caterpillars are makers of silk. They weave single strands as they travel from their homes in the tent to the tender young leaves, their food supply, and back to their homes again.

With hordes of these hungry caterpillars, which are called larvae, moving back and forth, the twigs become white from the many strands of silk.

The tent is a protection from the rain and the wind as well as from enemies. The caterpillars also spend nights in their tents. As they grow, they become large, beautifully colored caterpillars.

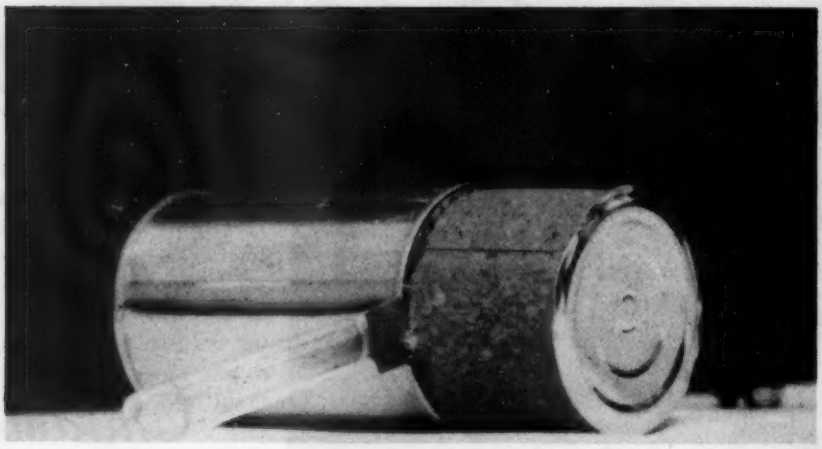
When it is full grown, the caterpillar leaves the crawling horde for the first time. Each goes its own way to search for a place to spin around itself, with silk from its own body, a snug-fitting house, called a cocoon. Inside this cocoon, the caterpillar will rest as it changes into a winged moth.

A brown moth comes out of the cocoon in early summer. The female moth places a band of eggs, laid one against the other, around a wild-cherry twig. The eggs are covered with a froth that dries like shellac. Within this covering, three hundred to four hundred eggs are protected throughout the winter.

When spring days come again, the warm sun hatches the eggs. From each one crawls a tiny, slender caterpillar, its body covered with hair. Thus another generation of tent caterpillars has been born. Again Billy and Jane can watch them come and go from their silky tents.

Farmers who destroy the wild cherry trees to get rid of the tent caterpillars often find that the pests have moved into their apple trees. Strange as it may seem, the wild cherry trees apparently do not suffer from this insect, and many farmers find it best just to leave them alone.

. . . *The End*



KEEPING DOG FOOD FRESH

For those who have dogs that do not require a full can of dog food each day, there is a simple and neat way to keep the remaining portion in the refrigerator without having it become dehydrated and discolored.

Simply cut both the bottom and top of the can loose on a mechanical can opener which does not leave ragged edges. Place two fingers against the loosened tin on one end and push out as much of the food as you intend to feed. Then cut if off as shown in the accompanying photo.

Remove the tin top from the severed half and replace it on top of the food remaining in the can.

The remaining portion of food will keep fresh for a long time in its original container and in its original form with no further bother.

Outdoor Reveries

May Magic

By John H. Day

I WALKED slowly up the open timbered slope, hoping for a rendezvous with the "hoot" owls said to be rearing a family in the wild grape tangles near the ridge. The undergrowth had been cleared by grazing sheep, turning the hillside into a wooded park, with towering oak and poplar competing with hoary-headed beech patriarchs for a place in the sun. The owl clan is equipped with marvelous hearing facilities, and I picked my way carefully, trying to avoid snapping dead twigs or crunching the dry leaves underfoot. The airy shadbush was blooming and dogwood buds were beginning to answer the lure of the warming sun.

My route followed a line fence, tracing out a path across a rocky outcrop and finally nearing the nesting area. The trees were talking big in a stiff breeze, which served to deaden the racket of my approach. I watched the woods ahead and suddenly noted a gray hulk some sixty feet up in a black oak, perhaps two feet out on a huge limb.

A shroud of grape vines helped hide the quarry but the glasses pinned it down as a big round-headed owl moping there in its hideout until sundown. I sprawled at the base of a neighboring tree and watched as the gusts ruffled its feathers and occasionally threw the bird off-balance. There was no indication that the owl knew I was in the neighborhood.

Suddenly my attention was drawn to some motion in a neighboring tree and the glasses revealed the two young owlets, perched side by side, observing me with unwinking solemnity. They were nearly full-grown, but had not yet completely lost their fledgling look. Their eyes were brown, sure field mark of the barred owl, the most common big owl of our timberlands.

I moved about, trying for a better view of the old bird. She made nary a move until I crossed the low wire fence. Then she took off through the trees with the noiseless, moth-like

flight characteristic of all owls. On the instant it seemed that every crow in the township was alerted. I could follow her route by the tremendous and indignant corvine uproar.

The two little fellows sat tight, even though their mother had deserted them. The made no sound, no bill snappings, but just sat there and watched me with those big reproachful eyes. Finally I tired of the waiting game and tried tossing a stick up to their lofty perch.

A long grape vine hung down close by their third-floor apartment. I rattled this against their branch and they suddenly lost their aplomb and took off through the trees. One appeared to alight on the ground about eighty yards off, but when I hot-footed over there the owlet was nowhere to be found.

Making acquaintance of this owl trio added hugely to the enjoyment of the early May afternoon. Owls are most interesting citizens. Creatures of the night surrounded by centuries of superstition, owls have symbolized luck, magic, mystery, secrecy, calamity and prophesy. Their uncanny midnight hooting, with now and then a fearsome scream, has earned them a place in literature as harbingers of direful fate.

Leaving the woodland, I paused for a drink of delicious Adam's ale at an upland spring, then swung back down along the fence line to the roadway. The unusual owl activity had stirred the crows into tremendous ribald hullabaloo. They were all about shouting "Owl" at the tops of their lungs.

Through some quirk of fate one black fellow had lost all his tail feathers. He made a most comical sight, skidding around in the three-alarm excitement of the owl heckling. He seemed to have difficulty in balancing himself, but he got around all right, despite the fact that his rudder was gone.

The creek in the valley was running crystal clear so I trailed along through the lush bottomland growth, inspecting a few long pools and scaring up a frog here and there. There were some sizable chubs and a few suckers in the deeper pockets, and I saw two small bass, and great multitudes of minnows.

Along one eddy there had been a tremendously successful tadpole hatch. I thought at first that a dark oil scum had washed in along the muddy shoreline, but a second look revealed hundreds of tiny tadpoles scarcely a half-inch in length, crowding the shore for a distance of several yards. They must have been finding some sort of minute food supply there and they kept crowding over each other in their eagerness to get to the banquet table. One watersnake chancing along that way could probably have wiped out the whole entourage, but only at the price of a terrific case of indigestion.

Where the broad stream falls across a shallow riffle I waded through to the consternation of several crayfish, who scuttled about at a great rate. A few moments later I picked up a crawdad crawling along the roadway, many rods from the water. He was deep blue in color, from his nippers to his tail, and I suppose was one of the chimney crayfish—those fellows that bore "snake holes" along country pathways, and build mud chimney turrets about these dark entries.

Maytime is house hunting time for the burly queen bumblebees, those big black-and-yellow ladies with the mellow, breezy bass voices. During the cold months they dozed in some cozy hideaway but now their first care is a persistent search for a proper apartment in which to set up housekeeping. Any rude cavity or hole in the ground will do, so long as it can be fitted up to the queen's taste. An abandoned field mouse's nest is made

to order, and the lucky queen who finds one of these snug dens moves in promptly.

As a worker in wax the bumblebee cannot be compared to the hive bee. She is primitive and awkward in her cell-making techniques, but she pays her way by her engaging dunderheadedness and her priceless service to farmers and orchardists throughout the land. "They're lazy to look at, an' kinda' go buzzin' and bummin' around so slow," but the bumblebee is a solid citizen.

Of all the months in the colorful outdoors calendar, May is perhaps the best in which to "go forth under the open sky, and list to Nature's teachings." Even the hard-bitten Anglo Saxons knew these 31 May days as the "flower month." The heartbeat of the soil is quicker now, and every greening wildling strains at the leash to answer the call of sun and gentle rain.

The countryman notes the hurrying, searching bumblebee as part of the wayside scene in May. No matter where he stops for a "breather" while scrambling along the hillsides or exploring the thickets, one of these rovers of the underwoods soon comes zooming by, investigating every nook and cranny.

When she finds a haven to her liking, Madam Queen may bring in some soft dead grass for the nursery floor. Then she hustles out to the flower fields for some pollen and nectar. This loot she fashions into a little ball of beebread. When she gets enough beebread "baked" she lays tiny eggs on the batch and covers them with a thin sheet of wax.

In due course the eggs hatch into bumblebee grubs who start right in demolishing that delicious beebread. They eat themselves drowsy full and nod off to sleep in cozy yellow cocoons. In about two weeks there is a great stirring in bumblebee lodgings all across the old fields and meadow bottoms. New voices join the bass section of the clover field choral society and honey production charts show a gratifying increase.

The countryman revels in the welter of bird song and the great drifts of bloom along his favorite woodland trails. From the crucible of Spring come pouring great glowing ingots of the returning season's gold. Even the fresh-turned earth in the brown furrows smells almost good enough to eat.

One who knows the outdoors makes his own appointments in May. From year to year he remembers, and needs no one to tell him what to see, what to listen for or what delights of fragrance will tantalize his nostrils. He has his own program notes and the unfolding pageantry is balm to his Winter-jaded soul. "Is it so small a thing," he says, "to have enjoyed the sun, to have lived light in Spring?"

April showers are a necessary prelude to the tremendous blossoming of the countryside, but the outdoorsman treasures those soft washday rains of May which spend a dreamy afternoon cleaning up the grass and flowers. All the shreds and tatters of Winter are washed away and the world is clothed in new and spotless livery.

One of May's first and most important jobs is the nurturing of the tiny spears of grass which have followed the gleam of April across the hills. This lush first grass is the supreme triumph of the chemistry of soil and rain and sun. Grass, not gold, is the basis of empire. Nations have become great because of an abundance of it and civilizations have perished because of the lack of it and the neglect of it.

Grass is one of God's greatest gifts to man, least appreciated, most abused. When its natural cover is removed the good earth is exposed to the ravages of wind and rain. Grass has meant sorrow, despair, exultation to multitudes. Colorful flowers and birdsong steal the show, but the

greening fields are a first order of business in Maytime.

Once the new grass is up and doing, the magic of May shows its hand in apple orchards all across the land. The matchless performance of apple blossom time, with breath-taking panorama and heady fragrance, is of the very essence of Maytime. The countryman tries to come up-wind to all the orchards in his hiking territory, with his nose far out ahead in the perfumed air.

There comes a time in May when the eager countryman finds himself so intoxicated by all the pageantry of the returning season that he drifts off into a delicious languorous binge. There are garden rows to be spaded and screens to be hung, but he wanders around in a slothful daze, as though suspended in time. Nothing matters except that Winter is over and May is here again and he intends to enjoy his Spring fever to the utmost.

. . . *The End*

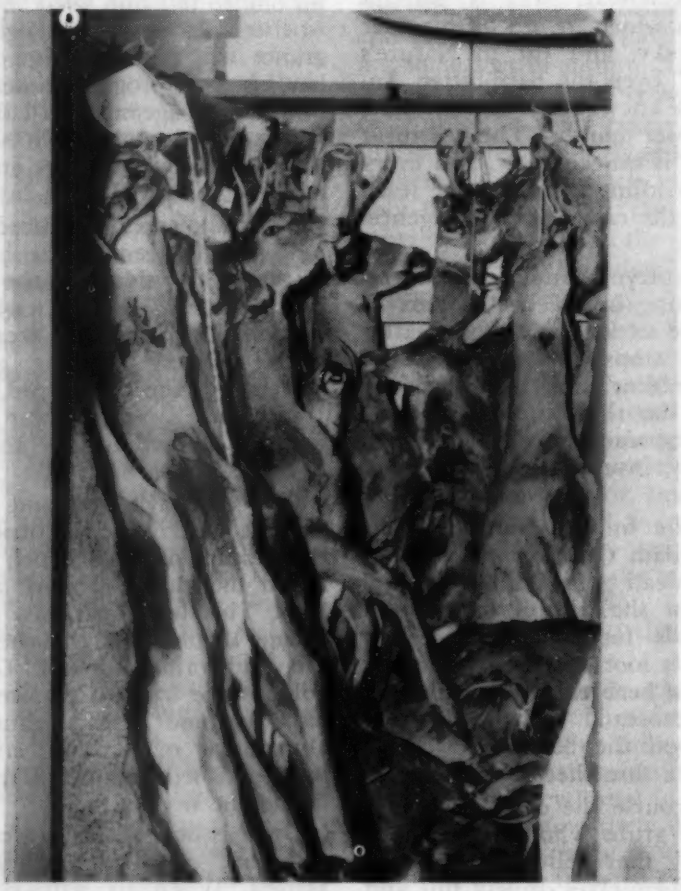


Photo by Wellsboro Chamber of Commerce

During the past season more than 72,000 deer were killed by hunters in Pennsylvania, which means a lot of meat in anyone's language. Each year more and more steak-conscious hunters are seeking better means of keeping their venison in good condition. Evidence of the increased use of locker plants can be seen in the above photo of a plant in Wellsboro that contained 84 bucks.

Reload To Keep Shooting

By Ed Shearer

PART VII

FOR more than half a century reloading tools have been on the market. One of the pioneers in the development and manufacture of reloading tools was John M. Barlow, who founded the Ideal tools which the Lyman Gunsight Corporation is producing to this day. Barlow was a shooter himself and had first hand knowledge of the shooter's problems. Millions of these tools have been sold throughout the world and it is doubtful that any center-fire cartridge was ever manufactured in this country that could not be reloaded with an Ideal tool.

Apparently there is a great deal of misunderstanding among our shooters concerning the selection of reloading equipment. After reading high-powered advertisements most shooters think that the excellence of their hand loads will depend upon the amount of money spent on their reloading tools. Nothing could be farther from the truth; accuracy is dependent upon the skill and intelligence of the operator rather than the cost of the equipment.

There is ample proof that super-accurate hand loads can be produced by using the most inexpensive tools on the market. Marcy Prescott, a bench rest shooter, won the Donaldson trophy at the 1948 Johnstown (N. Y.) bench rest tournament, using hand loads he made up at the firing line by reloading the same cartridge after each round with an Ideal "nut-cracker" tool. The loads turned out with this least expensive reloading tool on the market made a ten shot group at 200 yards that measured less than an inch and a half.

On the other hand I've seen poor to fair hand loads turned out on reloading equipment with a host of gadgets that would delight any experimenter.

Commercial reloading tools on the market may be grouped into two types—the long type and the bench type tools. The latter is usually of the straight line loading design. The tong type tool is generally referred to as the nut cracker. The Ideal tool is the leading example of the tong type tool and I believe the only one on the market today. Formerly it was put out in two versions. The adjustable and the non adjustable tools. According to the latest Ideal handbook it is made only in the adjustable tool today which is a good thing.

The tong type tool has come in for a lot of criticism which is due in large part to the belief that they are relatively simple to operate. Due to its construction it requires great care to keep the various operations uniform and the seating of the bullets in a straight line. So until the beginner has acquired some skill his product is quite likely to be mediocre. The one thing that makes them popular today is the fact that they are inexpensive. One disadvantage is their slowness, requiring changes of dies for each operation. Here is where the beginner runs into grief as he neglects to use care to achieve the same precise settings each time. So instead of being simple to operate, I believe that it takes far more expert handling to achieve good results with the tong-type tools than with the bench-type which leaves both hands free to control all operations.

The bench type reloading tools of today are practically all of the straight line reloading type. In view of the advertising claims made for this type tool they are not as fool proof as some would have us believe. It is as entirely possible to go wrong with the straight line as with the tong-type reloading tools.

For example take the shooter who has an over-size chamber in his rifle and therefore desires to neck size his cases only. He would probably find it necessary to full length resize his cases to get them in the loading chamber of his tool. Modern reloading tools are cut slightly large to take care of the variation and tolerences that exist among the different makes of firearms. Now if this same tool is used by a shooter who has a minimum or tightly chambered rifle there is bound to be some amount of play in the chamber of the tool when the case is inserted. So there may be tipping of the case during the various operations which will destroy the straight line effect if not carefully guarded against.

The solution is that the handloader should carefully study his equipment and find out its limitations so that he can operate it intelligently. No reloading tool will do your thinking for you. There is no question that modern bench-type reloading tools are far superior to the old tong-types. The fly in the ointment is that even in the cheapest grades they cost twice as much as the tong type.

So to sum it all up the selection of the reloading tool should be based on the following: what kind of hand loads are you going to make? Will they be fired in more than one gun? How many hand loads will you average per month and how important is speed to you? As far as any individual make is concerned it's largely a matter of individual preference. I have several makes and they all do good work within their limitations. If you reload for one gun only where neck sizing is preferred one of the more inexpensive tools will be entirely suitable for your needs.

If full length case resizing is required or a great quantity of reloads are needed you had best figure on one of the higher priced reloading tools. Of course you can get around the full length resizing problem by buying a separate full length resizing die but using this is a slow process.

Keeping the above points in mind we will take a look at some representative tools with their good and bad points, and their respective prices.

The only tong type tool remaining on the market is the Lyman Model 310 which sells for about $10.00. This is a very much improved version of the old Ideal and has one excellent new feature–a newly designed seating punch which allows straight-line primer seating of regulated depth.

Accessories for this model include a bullet-sizing chamber which screws into the tool in the usual manner. A lubricated bullet is dropped in and a special punch follows. Closing the tong handles force the bullets through the die. Though a trifle slow in operation it will do a proper job of bullet-sizing. A muzzle-sizing die is furnished to mouth size revolver cartridges or neck size rifle cartridges. This unit can be used in connection with the inside expanding die for expansion of the case neck after resizing. Bullet seating is accomplished by a double adjustable bullet-seating chamber which allows the bullet to be seated at any desired depth. A separate hand resizing full length die must be used with the tool. This tool is greatly improved over the old model both in design, material and workmanship. It's a lot of tool for the money and although it is necessarily slow it is a good bet for the beginner who does limited reloading.

Lyman recently brought out an entirely new bench type tool called the Straight Line Jr. This is totally different from the Straight Line Sr. which is an armory press. It is a husky yet compact turret head bench press in the ten pound class and uses the same adjustable dies that are available for the tong type tools. The rotating head is self centering in any position and the head is designed so that the necessary dies for complete operations for one caliber are set up at all times. This tool is regularly furnished with a decapping chamber but no dies. The last quoted price I have is $22.50 complete for a single caliber. Interchangeable dies may be had on order for any additional calibers.

Belding & Mull of Phillipsburg, Pa., is one of the oldest makers of reloading tools and accessories on the market today. I have used one of their first models for over a quarter of a century and it is still turning out top grade hand loads today, which speaks well for the materials and workmanship. Their newest Model 28 is quite an improvement over the older models, as it does away with the old hand bullet seater. This tool decaps and recaps in one operation with an adjustable seating depth for primers. It has interchangeable recapping shanks of different sizes with suitably shaped faces for all primers, thus solving the problem of mutilated primers. Resizing and expanding cartridge cases is accomplished in another operation. A new design utilizing lock nuts makes the changing of dies a quick operation and they hold the same adjustment. Additional dies may be obtained at low cost to adapt it for different calibers. While fitted with bullet-seating dies it does not crimp revolver cartridges. For this operation the makers suggest that it be used with their model 26 hand bullet seater. This is a very good tool for the shooter who does not demand quantity production. It sells for around $19.00 complete for one caliber.

The Pacific reloading tool made by the Pacific Gunsight Corp. is a bench type tool that has been on the market since 1930. This tool has a horse shoe shaped frame with a malleable cast iron base designed for bench use. An extension of one prong holds the operating lever. This tool operates in practically a vertical plane. The various dies and attachments screw into the upper arm of the horse shoe during the period of their use, eliminating the spilling of powder that is one of the faults of many tools on the market. The shell holder of the Pacific is of the rising type and its resizing and decapping die is screwed into the upper arm in proper position. The fired case is slid into the holder and the operating lever raised forcing the case into the die. This operation decaps and resizes the case either full length or neck only, depending upon the dies being used. In the case of revolver cartridges the dies remove the crimp and slightly bell the mouth of the shell in one operation, making this tool suitable for quantity production. A primer arm extends from the forward side of the tool and has a small cup surrounding the primer seating punch. The primer is placed in this cup face down and the primer holder pressed forward into the groove which is milled into the case holder and is held into position with the hand. Then the operating lever is pulled downward, extracting the cartridge case from the die by means of a suitable size expander plug which enters the case before resizing. This is drawn through the neck of the case expanding it to the desired diameter. Continued downward pressure of the operating lever forces the primer into the primer pocket. Then the operating lever is raised slightly and the arm flies forward out of the way, actuated by a spring in its base.

The lever is then pushed all the way down and the prepared shell is removed, ready for the powder. An automatic primer feed attachment is available. In the standard model a special aluminum support is clamped to the body by means of self contained screws. Into this a loaded tube is inserted. A spring stop built into the bottom prevents the spilling of the primers. The normal priming arm operates in the customary manner except that when being pushed to the rear by its spring it falls into the socket of the automatic primer attachment, allowing a primer to drop from the tube into the cup on the priming arm. When it is pushed forward to prime the cartridge case the stop spring is released, thus preventing any primers from dropping out. It is designed so that if the primer is not needed the arm can be permitted to spring back into its charging position with no double charging. Bullet seating is accomplished by screwing in an adjustable bullet seating die. You simply place a shell in the holder and a bullet in the shell mouth and raise the operating lever to its full stroke. The bullet is seated to any desired depth. The Pacific is made in two models—the standard, which retails for about $35.00, and the Super, with a much heavier frame costing about $10.00 more. The Super is strong enough for necking down cases, bullet swaging etc. This is a fast tool with a capacity of at least 500 shells an hour ready for the powder, and is a fine tool for the shooter who does a lot of reloading.

The Multiplex made by Jacoby & Thompson is a bit unusual because a single die is used for both neck sizing and bullet seating. It employs a universal bullet seating punch. Several accessories are available including a bullet puller. The necessary changing of parts for each operation makes it a bit slow. It sells for around $30.00.

The Meepos is a good general purpose tool from all accounts. It seems a trifle light for heavy duty work. It is particularly adapted for revolver cartridges but will handle all kinds. There is provision made for semi-automatic priming. It retails for about $30.00.

The Schmitt tool is of unique design in that it is one of the few rugged tools that is operated by a true horizontal swinging lever. It has plenty of power for full length case resizing, and handles large caliber cartridge cases with ease. It has automatic primer feed. Its chief drawback is that it is not designed to readily accept accessories such as bullet pullers, crimp removers or bullet-swaging dies. This tool has a good production potential and retails for around $40.00.

Easton's big giant is a very powerful bench tool of simple design. It is made from square sections of tool steel. The primer seating arrangement is not too good because the small space makes the insertion of the primer difficult. Price runs about $32.00.

The Jordan bench tool is of very neat turret head design and can be set up to load two different calibers without change of dies or adjustments. There is ample power for the full length resizing of the toughest rifle cases. The only complaint I've ever heard from users is the rather complicated system of changing dies, especially with the die controlling headspace for rimless cartridges. It is therefore at its best when set up for two calibers with infrequent die changes. The price of this tool is about $35.00, less dies which cost $21.00 per caliber. Makes it a mite expensive for the shooter with several guns.

The Hollywood line embraces the Model B. This is a massive tool which can be set up complete for five calibers with space left for a powder

(Continued on page 35)

York County

Twenty-first in a Series

Note: This center sheet can be removed if desired, without damaging the magazine, by loosening the two center staples.

Land Area

The county contains 584,960 acres, of which 158,515 acres are forested. 426,022 acres are in farm lands and publicly-owned lands comprise, 2,812 acres, of which 1,324 acres are State owned.

Topography

With the exception of a few mountains York county consists chiefly of gently rolling agricultural lands and small woodlots. Wooded bluffs line the rivershore over much of the county's eastern border.

The county is drained by the Susquehanna River and the Yellow Breeches, the Conewago, the Codorus and the Muddy Creeks.

Transportation

Railroad transportation is furnished by the Pennsylvania, the Western Maryland, and the Maryland and Pennsylvania railroads. The Lincoln Highway (U. S. 30), U. S. Route 111, and other important routes traverse the county, which has 1,013 miles of improved State highways.

District Game Protector

Stephen C. Mace, R. D. 1, Manchester, has jurisdiction over Fairview, Monogham, Carrol, Franklin, Newberry, Warrington, Washington, Conewago, Dover, and Manchester townships.

Earl E. Geesaman, R. D. 8, York, has jurisdiction over Paradise, Jackson, West Manchester, Spring Garden, Penn, Heidelsberg, North Codorus, York, Springfield, West Mannheim, Mannheim, Codorus and Springetsbury townships.

Daniel H. Fackler, R. D. 1, Windsor, has jurisdiction over Hellam, Windsor, Lower Windsor, Chanceford, North Hopewell, Shrewsbury, East Hopewell, Lower Chanceford, Hopewell, Fawn, Peach Bottom townships.

Fish Warden

John S. Ogden, supervisor, 242 East College Avenue, York.

Agriculture

Very fertile soil, including a rich limestone belt, produces excellent crops, making York one of the State's top-ranking agricultural counties. It ranks second among counties of the State in the production of chickens, eggs, corn, winter wheat, tobacco, swine and in the number of farms.

Industry

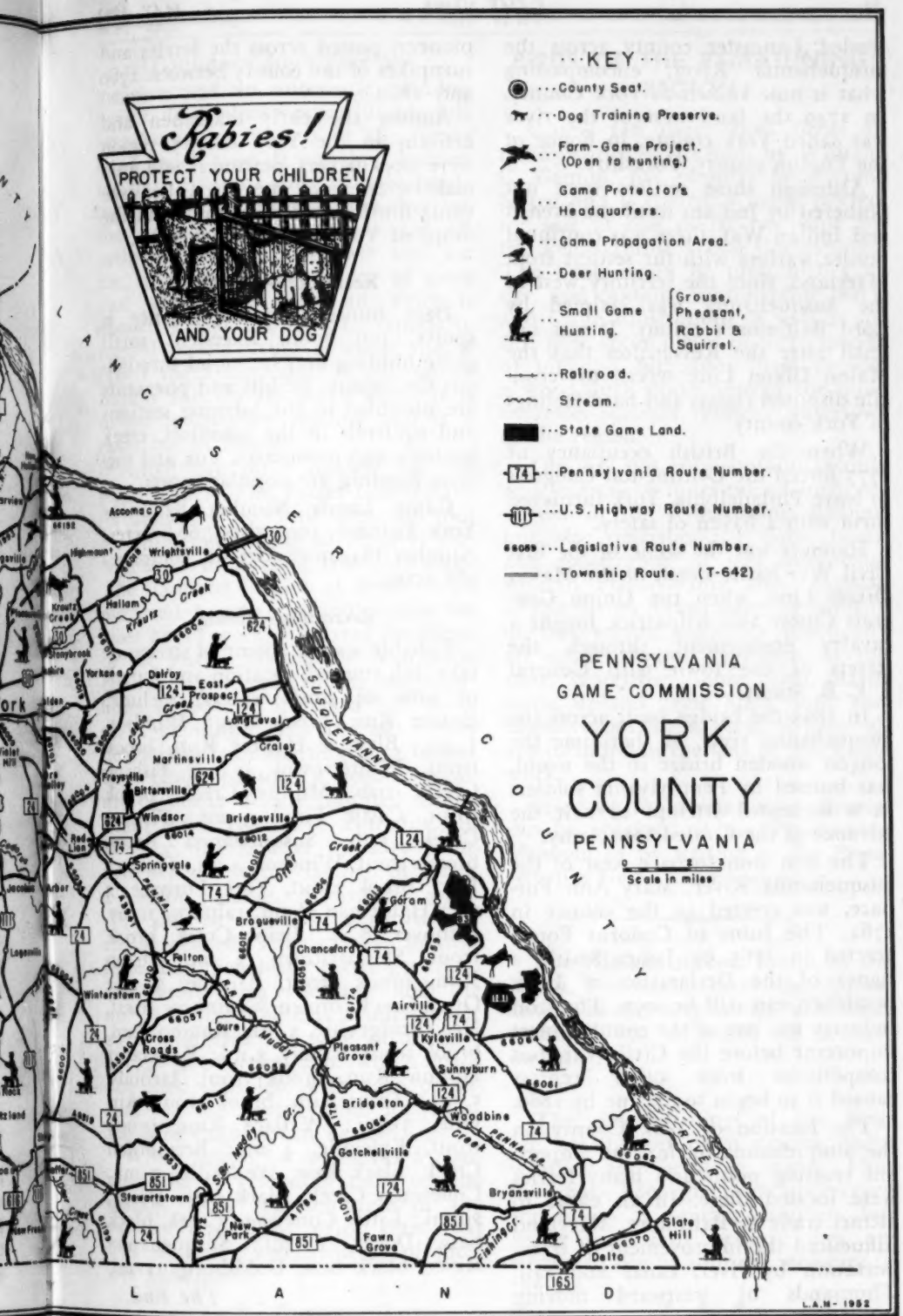
York county's chief mineral product is crushed limestone for roads and concrete. Portland cement is also made from local stone, roofing granules are made from slate quarried in the southeastern part of the county, and local clay is used in the manufacture of bricks.

Among its chief products are machinery and parts, cigars, chains, wire, furniture, grist mill products, silk and rayon goods, clothing, electrical machinery, safes and vaults and agricultural implements.

Historic

Prior to the Revolution the region was settled largely by Germans and Scotch-Irish. A treaty of 1736 ex-

CUMBERLAND COUNTY
DAUPHIN COUNTY
ADAMS COUNTY
MARYLAND
New Market
Yellow Breeches Cr.
Fishing Cr.
Yocumtown
Goldsboro
Mt. Pleasant
Lewisberry
Newberrytown
Dillsburg
Stony Run
Conewago Cr.
York Haven
Strinestown
Beaverdam Creek
Franklintown
Rossville
Mount Wolf
Manchester
Clear Spring
Wellsville
Ziona View
Emigsville
Kralltown
Eastmont
Dover
Davidsburg
Weigelstown
Shiloh
Bigmount
York
Codorus Creek
Little Conewago Creek
Violet Hill
Thomasville
Labott
Farmers
Nashville
Bair
New Salem
Stoverstown
Spring Grove
Menges Mills
Lehman
Seven Valleys
Seitzville
Porters
Jefferson
Larue
Hanover
Western Maryland R.R.
Penna. R.R.
Penna. Canal
Codorus Cr.
Blooming Grove
Pennville
Parkville
Brodbecks
Glenville
Pierceville Run
Createrville Cr.
Bandanna
Glen Rock
Seitzland
Railroad
Loganville
Jacobus
Arbor
Stewartstown
Kreutz Creek
Stonybrook
Rodlion
Fishel Cr.
Penna. R.R.
Codorus Creek
Little Conewago Creek
Conewago Creek
Fishing Creek
Yellow Breeches Cr.
Reading Co.
Penna. R.R.


Rabies!
PROTECT YOUR CHILDREN
AND YOUR DOG
···KEY···
···County Seat.
···Dog Training Preserve.
···Farm-Game Project. (Open to hunting.)
···Game Protector's Headquarters.
···Game Propagation Area.
···Deer Hunting.
···Small Game Hunting. {Grouse, Pheasant, Rabbit & Squirrel.
···Railroad.
···Stream.
···State Game Land.
74 ···Pennsylvania Route Number.
111 ···U.S. Highway Route Number.
66006 ···Legislative Route Number.
···Township Route. (T-642)
PENNSYLVANIA
GAME COMMISSION
YORK
COUNTY
PENNSYLVANIA
0 1 2 3
Scale in miles
SUSQUEHANNA RIVER
Accomac
Wrightsville
Hallam
Kreutz Creek
Yorkana
Delroy
East Prospect
Long Level
Craley
Martinsville
Fayetville
Bittersville
Windsor
Bridgeville
Red Lion
Springvale
Otter Creek
Broguesville
Felton
Chanceford
Goram
Winterstown
Airville
Kylesville
Cross Roads
Laurel
Muddy Cr.
Pleasant Grove
Sunnyburn
Bridgeton
Woodbine
Codorus Cr.
Penna. R.R.
Catchellville
Stewartstown
New Park
Fawn Grove
Bryansville
Fishing Cr.
Slate Hill
Delta
L A N D
L.A.M.- 1952

tended Lancaster county across the Susquehanna River, encompassing what is now known as York County. In 1749 the land west of the river was called York county, in honor of the English county, Yorkshire.

Although these settlers were not bothered by Indians until the French and Indian War, there was continual border warfare with the settlers from Maryland, since the territory west of the Susquehanna was claimed by Lord Baltimore's colony. It was not until after the Revolution that the Mason Dixon Line served to reconcile disputed claims and hard feelings in York county.

When the British occupancy of 1777 forced the Continental Congress to leave Philadelphia, York furnished them with a haven of safety.

Hanover was the scene of the first Civil War battle north of the Mason Dixon Line, when the Union Generals Custer and Kilpatrick fought a cavalry engagement through the streets of the town with General J. E. B. Stuart.

In 1863 the bridge built across the Susquehanna river, at that time the longest wooden bridge in the world, was burned by Pennsylvania soldiers in a successful attempt to halt the advance of the Confederate Army.

The first iron furnace west of the Susquehanna River, Mary Ann Furnace, was erected in the county in 1762. The ruins of Codorus Forge, erected in 1765 by James Smith, a signer of the Declaration of Independence, can still be seen. The iron industry was one of the county's most important before the Civil War, but competition from other centers caused it to begin to decline by 1860.

The location of York County on the Susquehanna made it an important crossing point and many ferries were located there. In an effort to attract trade to Baltimore, Maryland influenced the improvement of transportation by river, canal and rail. Thousands of westward moving pioneers passed across the ferries and turnpikes of the county between 1760 and 1840.

Among the early craftsmen and artisans in the York county region were clockmakers, pewterers and gunmakers. Some of the finest Pennsylvania flintlock rifles originated in the shops of York county riflemakers.

Recreation—Hunting

Deer hunting in the county is spotty, but good. Excellent small game hunting may be found throughout the county; rabbits and pheasants are plentiful in the farming sections and squirrels in the woodlots, creek bottoms and mountains. Fox and raccoon hunting are popular sports.

Game Lands Number 83, near York Furnace, comprises 760.8 acres; Number 181, near Airville, comprises 563 acres.

Recreation—Fishing

Fishable waters (name of stream or lake, fish stocked, location and length or area of stock waters) include: Beaver Run, brook trout, Windsor, 4 mi.; Blymire Hollow Run, brook trout, Wintertown, 4 mi.; Fishing Creek, trib. Muddy Creek, brook trout, Castle Finn, 3 mi.; Fishing Creek, trib. Susquehanna River, brown trout, Windsor, 4 mi.; Furnace Run, brook trout, York Furnace, 2 mi.; Haldeman Pond, rainbow trout, Hanover, 8 A.; Leibs Creek, brook trout, Stewartstown, 3 mi.; Orson Run, brook trout, Airville, 3 mi.; Otter Creek, brown & rainbow trout, New Bridgeville, 3 mi.; Rambo Run, brook trout, Rinely, 3 mi.; Rehmayer Hollow Run, brook trout, Jacobus, 2 mi.; Toms Run, brook trout, Airville, 3 mi.; Wallace Run, brook trout, Kyleville, 4 mi.; Bermudian Creek, black bass, Wellsville, 7 mi.; Conewago Creek, black bass, Dover, 20 mi.; Little Conewago Creek, black bass, Dover, 6 mi.; Susquehanna River, black bass, Goldsboro, 11 mi.

. . . *The End.*

(Continued from page 30)

measure and an automatic priming device. It is plenty powerful for full length resizing and is of the turret head bench type. It has shell holders for four different size cartridge heads together with primer punches of the proper size and shape for all primers. This is a de luxe tool for the shooter who has a lot of guns and who shoots them all. Price is about $70.00. A small, especially rugged model using a single die is called the Hollywood. It will swage bullets and do all heavy work. It is suited to quanity loading and is a good bet at $38.00.

Potter has three models for the hand loader. The Potter Gem retails for about $30.00. This is a good tool for full-length sizing of revolver cartridges or neck-sizing rifle cartridges. The standard Duplex at $60.00 is an overhead bench type tool suited for most heavy work. The real headliner of the Potter line is the Automatic Duplex which sells in the neighborhood of $70.00. It has a full automatic priming device and has a very heavy base for mounting on a bench. It is equipped with a powder measure of Potter design mounted in the head. Two types are available. In the one, the powder measure cylinders are set at the factory to throw a certain charge. Additional cylinders can be ordered to throw any charge desired. This is chiefly used in reloading revolver cartridges and does away with checking and the use of scales. There is a micrometer adjustable type for rifle cartridges—a high production tool which loads one shell complete with each operation of the lever. Dies for most standard calibers can be had.

While this is by no means a complete list of reloading tools on the market it is representative of the various types and price class that will meet the requirements of most any handloader.

(To Be Continued)

BIRDS OF THE PYMATUNING REGION

A new 226 page book, *Birds of the Pymatuning Region*, by William C. Grimm, has recently been completed and is currently being offered for sale at one dollar per copy by the Pennsylvania Game Commission. The book is six by nine inches in size, and contains innumerable black and white illustrations as well as six full page color plates of forty species of birds. A full color cover depicts a wood duck drake, one of the most common summer resident waterfowl of the region.

The text not only contains records and interesting notes on all birds reported in the Pymatuning Region, but also describes the flora, fauna and topography of this interesting western Pennsylvania area. Because of the varied topography the birdlife of this region embraces practically all species found anywhere in the state. Waterfowl, shore birds, marsh birds, upland game birds, song and insectivorous birds, birds of prey—all are included in the text of this single work.

Birds of the Pymatuning Region can be obtained at the Pymatuning Museum or by writing to the Pennsylvania Game Commission.

The Alaskan moose, found in the Kenai Peninsula, carry the largest antlers in the deer family, sometimes spreading to a width of seventy inches.

* * *

The cheerful songs of tree frogs are heard most often during damp weather and before a storm. Thus they have been given an undeserved reputation as weather prophets, but really it is only because they are stirred to life by unusual moisture in the air.

* * *

Dandy Dogs

By Rutherford Montgomery

Photo By Maslowski & Goodpaster

Despite his small size the little-known least weasel is an efficient rodent and insect destroyer. From tip to tip the "pygmy weasel" measures a bit more than seven inches.

THERE was for many years, and may still linger, a superstition in the West of England to the effect that hares are hunted on moonlit nights by packs of little fairy hounds, known as "Dandy Dogs." This superstition might well have originated right here in our own forests because fairy hounds do hunt in packs at night, the superstition is based upon fact. The Dandy Dogs have been seen though no one has ever made any close observations of them, the fairy hounds being elusive and the chosen hour of the hunt is always a time when there is little light, but much deep shadow.

A very interesting bit of history comes to light in connection with these hunters. "Vair" is old French for fur, usually Ermine or Weasel. "Vairy" comes from this word and was changed by the English to "fairy," a name which persisted a long time as the name for the little english weasel. It has been suggested that Cinderella wore slippers of *vaire* not glass which is *verre*. In this case the truth seems more romantic than the accepted version, ermine slippers would be nicer for a girl who was to marry a king.

It has always been accepted as a fact that the weasel, be he the Bridled, New York, Bonaparte, Long Tail or Richardson's, is a destructive, blood-thirsty fellow who kills for the lust of blood and as such should be

destroyed ruthlessly. Any farmer who has discovered a whole flock of hens dead and uneaten, will heartily agree. But there is a weasel which should be welcomed by the farmer. He is a small cousin of the Dandy Dogs of England, the Least or Pygmy weasel.

It would require all of the powers of a fairy godmother to catch enough of these tiny hunters to make a pair of slippers even for a Cinderella, because they are not only elusive, they are small, no larger than a big woodmouse, chest measurement one and a half inches, depth through the thickest part of the body three quarters of an inch at most. That was the report made on a Pennsylvania Pygmy Weasel. They appeared to have been designed by nature to slip into a mouse hole, which they easily do, mice being their favorite diet with insects filling in when the mouse population gets low.

Getting back to the fairy hounds seen by moonlight. We are better able to understand why the country folks of West England were so sure they saw such hunters when we examine the habits of our own little weasels. None of the weasel family, and that goes for the Pygmy, are sociable enough after they grow up to hunt in packs. They are all surly and savage creatures that fight savagely even when they mate. But like all wild mothers mother weasel loves and protects and trains her young. So on a moonlit night in late summer or early fall it is possible to catch a fleeting glimpse of a family out hunting with the mother leading five or six savage and blood-thirsty children to the kill. In the case of our pygmy the game would be a field-mouse or a woodmouse, in the case of the English cousin, which is bigger the game might be a rabbit.

The known biography of this little killer would make a slim volume indeed, for few have observed it and not many specimens have been taken. Trappers who have taken hundreds of weasels may never had found a pygmy weasel in a trap or seen one alive. Quite a few of the specimens caught were taken in an ordinary mouse trap, caught while stalking the mouse.

This hunter is the smallest of all flesh eating animals, the littlest carnivore, the least weasel. In summer its coat is umber brown above and pure white without yellow tinge underneath. There is no black tip on the tail. In winter the coat is pure white. Like all weasels the pygmy is nervous and seems angry most of the time. It can be do the same vanishing act as a big weasel, but because it is so small the act seems more perfect. It is fearless, but it is also cunning and wary. If it hears you approach it it apt to vanish as though by magic, even on open, wind-swept ground where its white coat would seem to place it at a disadvantage.

Out in the woods you will be more likely to hear the least weasel than to see it. Its chirrup, chirrup may be heard from a thicket but you are not likely to catch a glimpse of the hunter, though he may walk out into the open and look you over with defiant curiosity. You may think you have seen a baby weasel, though a close look will tell you different.

I have seen and trapped many weasels but the only Pygmy I ever saw was on a fishing trip in Colorado on the Western Slope of the Rocky Mountains above Gunnison. I had been fishing in Mill Creek and had caught a nice mess of brook trout. Before starting down the trail I sat down on a rock and dropped my creel. I was roused from my contemplation of the far slope by a flash of movement in the grass near the fish creel. A moment later a small animal popped out of the grass and started trying impudently to get into the basket.

At first I thought it was large field mouse but after a second look I decided it was a baby weasel, one

more enterprising and further advanced than most little weasels of its size. When he did not run away I waved my rod at him. He just sat up and hissed at me. He wasn't over five inches in length but he had all of the angry impatience of any weasel I had ever met. Thinking to have a bit of fun with him I took a small fish from my basket while he danced about making passes at me and then at the basket. The fish was perhaps eight inches long. I sunk the fly hook into the tough, projecting upper lip of the trout and dangled the fish above the little hunter. The weasel danced and leaped and ducked as he tried to get hold of the fish. Suddenly he sprang high into the air, sunk his teeth into the back of the trout and jerked it from the hook. Off he darted into a thicket dragging a fish bigger than himself.

I did not realize for some time that I had just met the smallest of the carnivore. But as I recalled the markings and the build of the little weasel I began to wonder and later started digging for information. I found a few scattered accounts and a number of excellent descriptions. The Pygmy Weasel was a breed apart from the other weasels though a member of the family. It was found from the Arctic as far south as winter snow conditions fitted its way of life.

Why the tribe has not increased I do not know. Certainly few are caught. It does not seem likely that the hawk or the owl would catch many of them, though the owl does manage to kill a few weasels, sometimes to the sorrow of the tiger of the air, as the records show. One dead owl and one dead weasel with its fangs sunk into the neck of the owl, mingled fur and feathers decomposing on a sunny slope. Perhaps it is due to the savage nature of this tiny hunter. His way of life is the way of one who goes out of his way to seek trouble, and his home life is as savage as his hunting.

It is possible that many hunters have seen the lesser one and thought him just a little weasel not yet full grown. But it seems hardly necessary to urge hunters not to shoot him, because very few will get as good a look at the small one as I did. But any who recognize him should greet him as one who does considerable good in his tough and cocky way.

. . . *The End*

While most birds are able to move only one, both mandibles of the parrot's beak are movable and are endowed with considerable muscular power.

* * *

When carrion attracts king vultures and common vultures, the common vultures stand back while the king vultures eat their fill.

* * *

The young of the Opossum weigh only about 4 grains two weeks after birth, yet are quite active.

* * *

The common shrew will starve to death in two or three hours unless food is obtainable. It will eat twice its own weight of food each day.

* * *

Whales can dive to enormous depths. There is a record instance of a sperm whale becoming entangled in a submarine cable 3,200 feet down.

* * *

The largest frog is the Goliath frog of West Africa. Its large thigh bones are highly prized by the natives for use in ceremonial rites.

* * *

The bald eagle was adopted as our national emblem by the Congress on June 20, 1782.

* * *

The hippopotamus differs from the rhinoceros in having four instead of three toes.

Long Range Hunting Rifles

By Ed Shearer

HAVING discussed deer rifles and brush rifles in recent columns some of the hunters I met this past season have said, "Why not give us your ideas on long range rifles." I have consistently side-stepped that one ever since I started writing this column, for several reasons.

In the first place while in the forestry service I spent two bad winters practically living with the deer, feeding them and studying them. I had a number of examples of bad and promiscuous shooting on my hands. The helplessness in the eyes of these cripples as they watched you, too deep in their suffering under intolerable conditions to run away—it's not a pretty sight. I love wildlife too deeply to ever acquire the nonchalance of a butcher.

I firmly believe that no man (or woman either) has a moral right to use a weapon on our wildlife until he has acquired sufficient skill to insure clean kills under average conditions at the range at which he takes his shots. Every hunters prayer should be, "Oh God, let me kill cleanly or miss completely."

In the second place long range shooting does not lie within the skill of the average hunter, or above average, for that matter. This is a field for experts only—those hunters who have spent years studying their rifles' performance at long range. Usually they are the product of a military range or live in a location that affords plenty of long range practice. For instance, from my yard I can shoot at various game-sized targets at all ranges up to 600 yards. A hunter of this class will fire more ammunition in one year than the average hunter will in a lifetime; he is a perfect combination of range and woods experience.

There is one thing we should get clear before some wild-eyed brother starts braggin' about killing 'em day before tomorrow with the "thutty-thutty." Just what is long range? In woods parlances I would say that long range begins where a long woods shot leaves off and still quite short of what a military shooter calls long range. A poll of opinion among experienced deer hunters of my acquaintance agreed that 200 to 250 yards "were a right fur piece in the woods." So to establish long range in the game fields let us take from 250 yards to an extreme of 500 yards. This latter is what a military shooter would call midrange.

There is no shadow of doubt that plenty of game is being taken within these ranges in the West while today game within these ranges seems to be the rule rather than the exception in Africa. Now during my years at Camp Perry and looking over the scores of recent national matches, I've not seen anything that leads me to believe that the West has a monopoly on capable long range shots.

Whenever any of our top flight hunters or shooters went to Africa they left a shooting record that was long remembered—notably Stewart Edward White, Don Hopkins and many others not so well known. I grew up in the same town as Don and

have shot with him enough on the range to know that he was a fine shot before he moved west.

The average hunter may well ask, "How do you judge a capable long range shot and how does he get that way?" That takes some answering, but for a start I'd say a man who can put ten consecutive shots in the bull at 600 yards in the military target should hit a deer at 400 yards with proper equipment if he evaluated the conditions just right. The woodchuck hunter should be able to take a deer around 100 or 150 yards farther than he takes his chucks and with about the same degree of certainty. I know several shooters this would put in the 400 yard class. The stumbling block for us all is the difficulty of estimating range under varying conditions.

The vital shoulder area of our Pennsylvania deer runs about 10 inches square in our larger deer and about 8 inches in our smaller deer. Thus, a hunter is effective only at the range at which he can keep his shots in an 8 to 10 inch group, which is 2 minutes of angle at 500 yards. It can be readily seen that most of our deer rifles can do the job at 200 yards but from there on out the going rapidly gets tougher and something better is needed.

The first thing the average hunter will note is that long range rifles are somewhat heavier than woods rifles. They will run from about nine pounds with scope and sling to as heavy as the individual can lug and still have strength to crawl back to camp at night. It can be stated here that this type of hunter is usually a watcher from the high places and not a brush buster, so he can pack a heavier gun without undue fatigue.

Accuracy should not exceed 1½ minutes of angle at all ranges which means 1½ inch groups at 100 yards and 7½ inch groups at 500 yards. The smaller the group the more leeway you have on errors. To remain in my gun rack a rifle of that type must do a minute of angle or an inch per 100 yards at all ranges. That means a bolt action, for no other type repeating action could take the pressures necessary to get the trajectory and accuracy at long range. Also, in this type of shooting you have time to get set, which means shooting from a prone or sitting position or a rest with a tight gun sling. Any rifle with a two-piece stock will throw its shots high or low as sling tension varies.

Speed of fire is a secondary consideration in this method of hunting. It is the aimed shot that counts. The more time and care in getting away the shot the better your chance of eating steaks.

The barrel should be of good weight although weight should not be overdone. A straight taper barrel of medium weight from 24 to 26 inches will be the stiffest and have the least vibrations for its weight of any type. I have been shooting such a barrel all summer and it shoots within one minute of angle right out to the limit of its working range. Furthermore in two months of shooting it held the same point of impact and put the first shot out of a clean cold barrel right in the normal group. Such a barrel is to be treasured. Believe it or not, it was a standard model bought across the counter. Walking and tooth pick barrels have no place in this game.

Here is where the target type stocks seen on most bolt action sporters come into their own. They should be longer than the brush rifle stock with high combs that support the cheek and center the eye in the scope. Drop at the heel should be slight. It only takes one belt on the beezer to convince one of the folly of a short stock on a gun that is to be shot in the prone or sitting position. A scope is a virtual necessity. Anything else is out of place on a precision long range rifle. It should be 4 to 6 power (one of the new variable scopes is a good compromise) and should have a me-

dium fine cross hair reticule. The cross hairs generally supplied cover too much of the game for fine holding at 200 yards and over.

The trigger pull must be light and break clean. Even a double set trigger is fine on this type rifle. You must be able to get the shot away when the cross hairs are just right. A good 7/8 or 1 inch sling completes the deal.

Present-day factory rifles and cartridges that can make the grade are limited to four calibres and two makes or rifles in the domestic field. They are the .257 Roberts, the .270 Winchester, .30-06 Springfield and the .300 Magnum, in rifles made by Winchester and Remington. With the exception of the Magnum I have shot them all this past summer and have a lot of data to go on.

With the possible exception of the .270 with the 130 grain factory load we might have to go to custom loads to get the desired results at long range. Factory ammunition failed to give me better than 2 minutes of angle, even in the model 70 Winchester.

But with handloads using 4350 powder and selected bullets it was a different story. Not only was velocity materially increased but accuracy ran consistently 1½ minutes of angle or better, under good conditions. The .257 especially gets a good lift out of 4350 powder. With a maximum charge behind a 100 grain Sierra bullet it breathes right down the neck of the .270 at all ranges out to 500 yards and has given me better accuracy. My own and other reliable firing data shows groups of 4 inches at 400 and 5¼ inch at 500 yards with this load. The 117 grain can be boosted to 2900 ft. velocity. These loads are the reason the .257 Roberts is on this list. Improvement in the .270 seems to lie in the choice of bullets, as this cartridge is already loaded to nearly the safe maximum. Any attempt to build up velocity by increasing the powder charge seems to build up pressure faster than velocity. The 130 grain bullet at 3140 appears to be the best bet.

The .30-06 is a problem, as there are all kinds floating around and some of them are definitely not safe with maximum loads. However, in a good rifle such as the model 70 Winchester the 180 grain bullet can be driven at 2850 ft. velocity with 1½ minute of angle accuracy. The 172 grain bullet which can be shoved along at better than 2900 ft. per sec. is probably superior, as it will expand more reliably at long range.

The .300 Magnum is the king of them all, commercially. With a belly full of 4350 powder it will chase a 180 grain bullet over the scenery at 3100 ft. per second, than which there is no whicher. The one flaw is recoil. Take your 12 gauge shotgun and a trap load. Sit down and coolly squeeze it off at a knot hole in a board. If you enjoy it you will like the Magnum.

Bullets are the problem. If they open up at the longer ranges they will probably blow up at the shorter. If they don't blow up at the shorter they won't open up at long range. On deer a blowup doesn't matter unless it is a raking shot when an occasional failure will pop up. With the exception of the Magnum it's doubtful whether any of them will open up from 400 yards on unless they hit bone, but they all have sufficient penetration on side or quartering shots.

One thing is certain—the bullet must be right for the calibre, with proper sectional density and good shape, to get results at long range.

Now that we have covered the equipment of a long range shot the only thing that is left is to correctly estimate the range, the wind velocity, the right amount of lead if the game is moving, try to get the normal sling tension and get the shot away when the cross hairs are just right to correct the foregoing conditions. Your equipment is equal to it. Are you?

. . . *The End.*

CONSERVATION NEWS

WARREN COUNTY NAMED "COUNTY OF THE YEAR"

During the March convention of the Pennsylvania Federation of Sportsmen's Clubs held in Harrisburg, Warren County was named the outstanding Pennsylvania county in conservation activity for 1951, winning the first leg of a handsome trophy. President S. Dale Furst made the presentation to Don Curtis, delegate from Warren County.

Five counties were entered in the contest; Cameron, Fayette, Lehigh, Montgomery and Warren. Judges were: Charles K. Fox, vice-president of the Pennsylvania Outdoor Writers Association; Johnny Mock, editor of ALL OUTDOORS, for the *Pittsburgh Press;* and Dr. Francis J. Trembley, head of the biology department of Lehigh University.

Among the many commendable conservation practices undertaken by the sportsmen of Warren County

Federation President S. Dale Furst (right) extends congratulations to Warren County delegate Don Curtis for their winning conservation program.

PGC Photo

were the establishment of a public fishing project, restoration of a dam and recreational development of the adjacent territory, building of eight pheasant rearing pens and the release of 2300 birds, distribution of packets containing seeds of shrubs and trees of value to wildlife, free distribution of multiflora rose seedlings to farmers, pruning of wild trees and carrying out release cutting program, augmenting State Game Commission bounty with a four and two dollar bounty on great horned owl adults and fledglings, financing of a mail-cancelling die for use in the Warren post office carrying a fire-prevention message and innumerable other worthwhile projects.

Highlights of the North American Wildlife Conference

Approximately one thousand conservationists, fish and game administrators, biologists, and sportsmen attended the 17th North American Wildlife Conference in Miami, which was held on March 17 through 19, according to the Wildlife Management Institute. Represented in the registered attendance were people from nearly all of the states and the provinces of Canada, Alaska, Mexico, and the Virgin Islands.

One of the highlights of the Conference was the presentation of a national natural resources policy at a general session presided over by the Honorable James H. Duff, U. S. Senator from Pennsylvania, who was assisted by the Honorable Clark W. Thompson, U. S. Representative from Texas. The sweeping policy, which covers the management and restoration of all renewable natural resources, including soils, waters, forests, and wildlife, was presented by William Voigt, Jr., chairman of the Natural Resources Council of America and executive director of the Izaak Walton League of America.

The policy was formulated by a committee consisting of the executive heads of the major national conservation organizations and has been endorsed in principle by most of the membership organizations in the field.

After the formal presentation of the policy statement by Mr. Voigt, the need for such a policy was discussed by a panel of four experts consisting of the Honorable Clifford R. Hope, U. S. Representative from Kansas; Newton B. Drury, chief of the division of beaches and parks, California Department of Natural Resources and former director of the National Park Service; Lloyd E. Partain, manager of the commercial research division of the Curtis Publishing Company; and Robert C. Cook, managing editor of the *Journal of Heredity* and author of *Human Fertility*.

The opening general session, devoted to shortcomings in the conservation program was a source of much interest to those attending the Conference. Cleveland Van Dresser, West Palm Beach radio commentator and author struck out heavily at laxity in the antiquated mining laws, which, he reports, are robbing the American public of alarming segments of their public lands. Mr. Van Dresser recently returned from a survey trip of the western national forests and public domain. The need for zoning the wilderness areas was discussed by Dr. W. J. K. Harkness, chief of the division of fish and wildlife in the Ontario Department of Lands and Forests.

The important role of insects and diseases in limiting forest production in the United States was reported by Lyle F. Watts, chief of the U. S. Forest Service. Mr. Watts pointed out that these two agents overshadow fire in their destruction of timber and watershed values. The development of chemical weed-

killers and insecticides and their effect on wildlife was reported by Dr. David G. Hall, chief of the division of information of the Bureau of Entomology and Plant Quarantine. Contributions to pollution control by the states were reported by David B. Lee, bureau of Sanitary Engineering of the Florida State Board of Health.

The final general session was devoted to a panel discussion of current waterfowl problems. Participating were George B. Saunders, flyway biologist of the U. S. Fish and Wildlife Service; Harrison F. Lewis, chief of the Canadian Wildlife Service; C. Gordon Fredine, in charge of drainage studies, U. S. Fish and Wildlife Service; Lloyd Scouler, California State Migratory Bird Committee; Elmer Peterson, director of the South Dakota Department of Game, Fish and Parks; and B. W. Cartwright, chief naturalist of Ducks Unlimited (Canada).

Throughout the Conference technical sessions devoted to all phases of natural resource management were conducted.

Refuge Streams Opened To Fishermen

Pennsylvania fishermen are very happy that many miles of trout streams formerly closed to them have been opened to angling this year.

The game law says it is unlawful for any person to fish in waters within the boundaries of any state game refuge, or to take fish from them, except such streams as the Game Commission may declare open to lawful fishing in accordance with the fish laws of the Commonwealth, or under such provisions or regulations as may be agreed upon between the Game Commission and the Fish Commission.

At their January meeting, the Game Commission approved the request of Charles A. French, Executive Director of the Fish Commission, not to close fishing on streams within state game refuges. This applies only to state game refuge streams that have been stocked with trout by the Fish Commission.

Signs posted conspicuously along such streams will notify the public that the waters are open to lawful fishing from April 15 to July 31.

Unposted streams in state game refuges will remain closed to fishing.

NEW KENSINGTON TRAPPER RECEIVES AWARD

John Patla, New Kensington miner and part-time trapper, was recently presented with a $200 award in connection with Sears, Roebuck & Company's Twenty-third National Fur Show. The result of twenty-five years' experience in trapping furbearers, Patla's pelts were selected as among the top ten received in a tri-state area during that week. The pelts were judged for proper handling and preparation in a contest designed to eliminate the appalling annual loss to the nation's trappers and fur industry through improper pelt handling.

The award was made at a Pittsburgh gathering attended by representatives of Sears, Roebuck and Company, the Pittsburgh and New Kensington Chambers of Commerce, the Pennsylvania Game Commission and district outdoor writers.

Opossums are rather slow-moving, stupid animals which seek safety by their retiring nocturnal habits and non-resistance to enemies. It is because of this last trait that the familiar "playing possum" originated.

* * *

The white Bishareen camel is the most valuable of the tribe, being very fast and capable of outrunning a horse. They make excellent mounts.

NEW YORK REPORTS ON HUNTING ACCIDENTS

New York State had 141 hunting accidents involving firearms in 1951, Conservation Commissioner Perry B. Duryea revealed today. Of that number, he said, 17 accidents were fatal, four more than in the previous year but one less than in 1949 despite approximately 100,000 more hunters afield. Six of the 17 fatal injuries and 37 out of the 141 non-fatal were self-inflicted.

Of the total accidents, only 17 involved deer hunters among the more than 400,000 persons who obtained licenses to take deer. Six were fatal, the same number as in 1950.

Again, accidental discharge of firearms from carelessness led the accident list with 74 injuries. Of the remaining 68 mishaps, 49 hunters were wounded by others firing at game while 13 hunters admitted they actually mistook their victims for game of one kind or another.

Major cause of injuries through carelessness was the fact that hunters failed to use the safety devices with which their guns were equipped. If these devices had been in use at least 60 of the 74 accidental discharges never would have occurred, Commissioner Duryea pointed out. Thirty guns alone were discharged when their users fell, crossed fences or when brush tripped the triggers. Two of them were discharged while carried loaded, illegally, in cars.

Rabbit hunters were the most shot –43 of them, one less than in 949, despite the fact that many thousands more hunters spent untold more man-hours after cottontails last fall because of generally more abundant supplies. Woodchuck hunters numbered only two less victims than deer hunters while partridge hunting drew 12 casualties, squirrels 9, pheasants 7 and foxes 5. The remainder were about equally divided between ducks, crows and a scattering of a half-dozen other species.

Shotguns caused 94 mishaps, rifles 45 and two were unknown.

Hunting Licenses Cost U. S. Hunters 38 Million Dollars

The sale of 12,660,993 hunting licenses during the fiscal year ending June 30, 1951, brought the 48 states an all-time high gross revenue from this source of $37,840,791. The 1950-1951 gross revenue exceeded by $199,742 the 1945-50 total, while the 1950-51 total of licenses issued was 23,192 greater than the previous year's total of 12,637,801. Nonresident licenses accounted for 15,598 of this increase.

Pennsylvania again ranked first among the states in gross revenue from license sales and second in the number of licenses sold.

For comparative purposes, the "big ten" in the license sales line-up are shown for the 1950-51 and 1949-50 hunting seasons. Michigan, Pennsylvania, New York, Ohio, Illinois and California—in that order—still head the list.

1950-51

Michigan	**$1,037,633**
Pennsylvania	**827,949**
New York	**805,608**
Ohio	**708,048**
Illinois	**496,749**
California	**493,247**
Wisconsin	**483,097**
Indiana	**432,319**
Washington	**413,385**
Tennessee	**358,639**

1949-50

Michigan	**$1,031,035**
Pennsylvania	**834,091**
New York	**751,036**
Ohio	**740,509**
Illinois	**503,420**
California	**497,212**
Minnesota	**479,746**
Wisconsin	**460,408**
Washington	**418,726**
Indiana	**392,821**

In "hunting fees paid," the first ten States are listed below:

1950-51	
Pennsylvania	$3,046,156
Michigan	2,980,350
Washington	2,243,616
Colorado	2,185,452
New York	2,179,792
California	1,928,863
Oregon	1,492,936
Missouri	1,135,939
Illinois	1,053,441
Wisconsin	1,016,307
1949-50	
Pennsylvania	$3,032,326
Michigan	2,944,885
Washington	2,228,907
Colorado	2,049,065
New York	2,043,004
California	1,946,867
Oregon	1,288,699
Minnesota	1,238,043
Wisconsin	1,178,763
Missouri	1,099,565

SHE BEAR AND CUBS MOLESTED

In the opinion of Claude B. Kelsey, a Clearfield County game protector, some humans will go to almost any end to satisfy their curiosity, even at risk of personal injury.

"During February," he reports, "we had no end of trouble trying to protect a pair of bear cubs. Two cubs were born to a mother bear early in February in the Winterburn Sabula Mountains. When it became generally known that the bears were in the vicinity the reaction was about the most inhumane I have witnessed. Many persons went to the den out of sheer curiosity; others appeared on the scene bent on molesting and worrying the mother bear. They punched her with poles and threw stones, sticks and flashbulbs into the den. Dogs were taken there to get the reaction of the old bear.

"I have had considerable experience with bears," said Kalsey, "but this mother had more forebearance than any bear I have ever observed."

The den was made a propagation area, but Kelsey says someone with authority must stand guard there anyway because some persons would go inside the wired-off area, even against law, to molest the little family.

Photo by Philip Da More

Victims of inhuman treatment this little family was driven out of their den by curious onlookers.

WOMELSDORF HIGH SCHOOL CLUB HAS DIVERSIFIED PROGRAM

In a recent letter Elwood E. Himmelberger, advisor to the Womelsdorf High School Junior Sportsman's Club, reports an intensely interesting and widely diversified program undertaken by the youthful members. He reports, in part:

"The club is one of the few in Berks County that has an active program of rabbit trapping, bird house building, fox trapping, instructions in firearm handling, a safety program, fly tying, motion pictures concerning wildlife, etc., field trips, and many other activities too numerous to mention.

"During the first year the club was organized they participated in the Pennsylvania Game Commission's rabbit trapping program, which they are also doing this year. Citizens of the borough were asked to communicate with the club advisor to request the services of club trappers in the event of garden damage by rabbits. The local rod and gun club participated in the program by giving each boy seventy-five cents for each rabbit trapped. At the time of this writing the total number of rabbits caught numbers 60. One member enticed 17 bunnies into his traps. Local sportsmen report the boys' efforts in this project has resulted in a larger bag of game in the vicinity of the town.

"Our local game protector, Elmer Turner, Centerport, has been very helpful to the club. So far he has supplied us with rabbit traps, taught the boys to operate them, gave talks on fox trapping, and started some of the boys on traplines of their own.

"Another source of information for our club has been the school custodian, Mr. Howard Batdorf. In addition to his duties at the school Mr. Batdorf is also a raw fur dealer. He attends every meeting of the club and has given many talks on trapping and fishing. He is very adept with the fly rod and has given instruction in its use—out of doors when weather permitted, and in the gymnasium during bad weather.

"The boys are also fortunate in having George Bashore, deputy game warden and angler extraordinary, visit the school frequently and show the boys how to tie flies. Mr. Bashore has also encouraged the boys to provide food for game animals during the winter months. One day some twenty pheasants were observed eating corn put out by club members for that purpose.

"During January the boys began a bird house building program, constructing their houses in accordance with the plans contained in the Game Commissions publications *Attracting Birds* and *Pennsylvania Birdlife.*

"Just before the opening of the hunting season the club observed Governor Fine's "Hunt Safely Week" by giving an assembly program on safety. While entering the auditorium the boys and girls were given the pamphlet *Ten Commandments of Safety* and during the program club members demonstrated the right and wrong way to handle firearms and the improvement of farmer-sportsman relations. Private property and safety zone signs were displayed and their meanings explained to the

Rabbit trapping champion of the club, Karl Fink, poses with one of fifteen rabbits he live-trapped for release last winter.

audience. A skit on the evils of illegal hunting and an explanation of the care of the hunting dog in the field were topped off with a motion picture dealing with safety in the field."

Sportsmen would do well to note the invaluable part played by interested, public-spirited individuals in offering their services to Junior Sportsmen's Clubs. With support of this kind, clubs cannot fail to respond with enthusiasm and worthwhile accomplishments.

Some birds cannot walk, while others walk with difficulty. Swifts, for example, never walk and never set foot on the ground, the Fish and Wildlife Service says. Nighthawks, whippoorwills, and other goatsuckers walk clumsily, having weak legs.

* * *

Bow and arrow hunters in the United States bag more than a thousand deer, a dozen bear, a few elk, and some puma, javelina and wild boar every year, the Fish and Wildlife Service reports.

* * *

Skunks are often justly accused of raiding duck nests and of killing ducklings, but skunks also eat quantities of snapping turtle eggs—and snapping turtles kill large numbers of ducklings, the Fish and Wildlife Service points out.

NOTICE OF COMMISSION RESOLUTION

WHEREAS, pursuant to the provisions of Act No. 564, approved January 14, 1952, the Department of Agriculture has given notice to the Pennsylvania Game Commission that the County of Chester is infested with rabies; therefore

RESOLVED, that under the authority of Articles I and V of the Game Law, as amended, protection is hereby removed from raccoons, on the list of game animals, in the County of Chester, as required by said Act, until further notice.

RESOLVED, that notice of the foregoing action shall be duly published in each County affected, in accordance with the provisions of Section 505 of Article V, of the Game Law, and that the Executive Director is hereby authorized and directed to certify the foregoing as a rule and regulation of the Commission.

Thos. D. Frye
Executive Director
Pennsylvania Game Commission

April 16, 1952

White 'Coon

PORT ROYAL, Juniata Co.—Food and Cover Foreman L. Kline, who resides at S.G.L. No. 215, caught a white raccoon in a predator trap near our ringneck holding pen and turned it over to me. "Whitey" now has a good home in the Hershey Zoo. He was all white except for an off-color on his front shoulder and a light creamy ringed tail. Whitey must have stayed out with the boys too late one night, as half of one ear had been chewed off. District Game Protector Owen E. Seelye, Port Royal.

Hawk Plays Rough

BLAIN, Perry Co.—Recently a sharp-shinned hawk caught a blue-jay in a pine tree in the lawn at my headquarters; and after the jay did quite a lot of growling, which attracted my cocker spaniel dog to the scene, the hawk released the jay and took off for parts unknown. District Game Protector Harold E. Russell, Blain.

More Elk Reported

WILLIAMSPORT, Lycoming Co.—I have had more reports of hunters that have seen elk or elk signs on McIntyre Mt. One hunter had the bull elk in sight of him for about 10 minutes and he was sure it was an elk and saw tracks of two other elk. One farmer saw one elk near his farm about a year ago. District Game Protector Levi Whippo, Williamsport.

Water Turkey ? ?

WILLIAMSPORT, Lycoming Co.—On February 23, 1952, I received a phone call from one of the beaver trappers in my district. When he went to check his traps in the morning he noticed that one trap was sprung and the drowning stone was pulled out into deep water. He started to fish his trap out, feeling sure he had a beaver. When he got what was supposed to be a beaver into shore it turned out to be a wild turkey. Apparently, the turkey was along shore for water and grit when it got caught. District Game Protector Paul Ranck, Williamsport.

Feed Makes the Difference

LIGONIER, Westmoreland Co.—It is hardly believable that there can be so much difference in deer that were born and raised within a five mile radius of each other—one living as a grazing animal and another as a browser where there is a limited amount of food. I had the opportunity to closely inspect two fawns of the same age, one from the farming country and one from the mountains. I would estimate that there was as much as 30 pounds difference in weight. From all appearances the better fed animal was far superior in quality of coat and bone structure. Conservation Education Assistant Robert Parlaman, Ligonier.

Beaver County's First Beaver

BEAVER, Beaver Co.—On February 27, I made out a beaver affidavit for what I believe to be the first beaver taken in Beaver County in modern times. This valuable furbearer was taken in Darlington Township along the Little Beaver River. I have had beaver in the various parts of my district for the past several years, but this is the first one to be trapped. The trapper told me if he had known they were so hard to skin he would not have bothered trapping for them. District Game Protector J. B. McGregor, Beaver.

Homegrown Foxes

CLAIRTON, Allegheny Co.—Life begins at forty for one lady in fox hunting. This lady, Mrs. Mary Reese, who is past forty, has taken her trusty shotgun and destroyed five

foxes in the last year. These foxes came into her yard and around the chickens; she has not gone from the yard to kill the animals. District Game Protector R. V. Rea, Clairton.

Winter Notes from Bradford County

CANTON, Bradford Co.—I have seen more turkeys at the corn feeders during the past three weeks than at any time all winter. I counted thirty-seven birds at one feeder on February 22.

Fawn deer are not in good condition. I have found three dead during the past three weeks on S.G.L. Nos. 12 and 36. We will have some winter kill if the heavy snow 10 to 18 inches does not leave soon. District Game Protector Duane E. Lettie, Canton.

Partial Albino

CLINTON, Beaver Co.—Among a small flock of starlings, which come to feed at the feeding platform in my back yard, there is one which stands out from the rest. It has a light brown body and head, but its wings are entirely white. Last summer there was a pair of starlings nesting in my neighbor's poplar tree, one of them was an albino, but this one is not the same bird. District Game Protector D. W. Heacox, Clinton.

More Ducks Wintering Here

BERWICK, Columbia Co.—A flock of about 30 black ducks are wintering on the Susquehanna River opposite the business section of Berwick. More ducks appear to be using the river and I believe it is because of the increased feed due to the cleaning up of the river. District Game Protector Lewis H. Estep, Berwick.

Wildlife Likes Browse

BLOOMING GROVE, Pike Co.—During the months of January and February our Food and Cover corps has been engaged in the work of cutting a border edge around the food plots on S. G. L. #183 and 180. Upon checking over the amount of work done the following was noted. Deer moved in immediately to browse the tops of the fallen trees, rabbits worked on maple and apple prunings, and foxes also worked around the brush heaps created by the cutting without success since dense cover is afforded small game. While this cut-

ting work was being done one day around a plot on S. G. L. #180, I saw two deer browsing on an area that had been cut the previous day just 150 yards from the working crew. It seems that from this occurrence, the deer, hearing the power saw and axe work, know or expect that a meal of browse is to be had. This is not unusual in most areas where there is a timbering operation. District Game Protector Albert J. Kriefski, Blooming Grove.

Crash Landing

GELATT, Wyoming Co.—While checking beaver dams during the past season, Deputy Felton and I happened onto one of nature's tragedies. We found the wind-dried carcass of a flying squirrel impaled on a barb wire fence. It was evident that the squirrel had been "flying" from a maple tree to the fence when a barb had pierced a membrane "wing" and left him suspended to die a slow death. Deputy Felton said he had seen a similar accident a few years before. District Game Protector Donald G. Day, Gelatt.

Man-sized Grouse!

WEST PITTSTON, Luzerne Co.—During this past hunting season, Harold Schobert of West Pittston shot a grouse which must come close to being the granddaddy of all grouse. When weighed at two different grocery stores, it tipped the scales at 3 pounds 4 ounces! The average for November-killed ruffed grouse is about one and a half pounds, with few ever exceeding two pounds. Examination of its wing and tail feathers by the Wildlife Research Division revealed that the grouse was an old male. Deputy Game Protector Floyd Ramage, West Pittston.

Spoken Like A True Sportsman

HUNTINGDON, Huntingdon Co. In the latter part of small game season, a man from Newton Hamilton

was hunting wild turkeys in the Licking Creek area, Huntingdon County, when he accidentally fell and broke his leg. When he arrived at the hospital, and was being examined by the doctor, he kept saying, "Watch out, now! Be careful! Watch out now!" Finally, the doctor demanded to know whether they were hurting him, to which he replied, "No, but just watch out you don't break that turkey caller in my pocket!" Wildlife Protection Assistant Lester E. Sheaffer, Huntingdon.

Hot Reception

STRASBURG, Lancaster Co.—I had an interesting thing happen when I recently liberated a cock bird where I knew there were some hens. The new bird did a lot of cackling as it left the crate, and settled down in a grove of pines. However, as soon as the stocked bird landed a native cock bird lit into and gave it a trouncing. This is the first time I have ever experienced this. What a fight! District Game Protector J. P. Eicholtz, Strasburg.

Ammunition for the Bow

By Thomas A. Forbes

PART I

THE Science of Ballistics in the mind of the average person is confined to firearms and ammunition ranging from the single shot .22 caliber rifle to the batteries of 16-inch rifles in the turrets of a modern battleship.

When gun enthusiasts congregate around the open fireplace in the winter evenings the conversation will shortly fall into a familiar pattern and the ear will catch snatches of conversation where the words *headspace, rim-fire, cases, pattern, lands,* and *hollow point* fill the air and to the uniformed make no sense whatsoever. Volumes have been written since the advent of gun-powder on this one phase of the science and the end is not yet in sight. Ballistics in its broad sense covers a far larger field. Defined as the science or art of hurling missile weapons by use of an engine, substitute for the words missile weapon the single word *"arrows"* and for engine the word *"bow"* and we realize that the archer, as well as the rifleman, is interested in the Science of Ballistics and the glossary of archery terms is no less confusing to the uninitiated than is that of the rifleman.

Since the bow was in common use throughout the ancient world, it follows naturally that both the bow and arrow varied widely in material and design. In parts of the world where the bow is still the principal weapon of primitive peoples it varies in size and drawing weight from the light weight three foot bow of the African pigmy to the moderate weight eight foot bow of the Siriono Indian.

The bow is the controlling factor in the choice of an arrow. In the case of the pigmy bow the arrow is only a sharpened twig weighing about eighty grains, while the arrow used by the Siriono Indian is more than eight feet long and one inch in thickness.

The metal arrow was first introduced in competition in the year 1927 and at the Annual Tournament of the National Archery Association the Double American Round was won with metal arrows. Old customs die hard but in the years intervening since 1927 metal arrows have largely supplanted the wooden shafted arrows for target shooting, principally because their uniform quality, lightness and durability have resulted in larger scores.

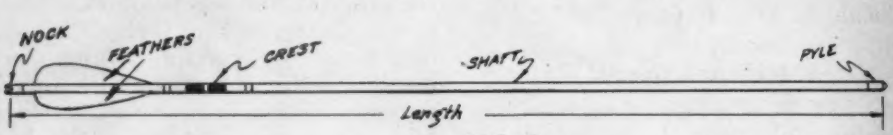


Fig 19

The principal parts of an arrow, Figure 19, are the shaft, pyle, nock, feathers, and crest. The woods most frequently used for the shaft are birch, spruce, Norway pine, and Port Orford Cedar. Inasmuch as arrows are

used for different purposes and consequently receive different kinds of treatment, economy dictates that the cheaper wood, birch, should be used for beginners arrows and knock-about shooting which is akin to plinking in the jargon of the rifleman.

Medium priced roving, and hunting arrows are also made of birch. The wood shaft is still a keen competitor of the metal shaft in the hunting field and good quality hunting arrows are made of imported Norway Pine and Port Orford Cedar.

Birch is a tough, hard wood found in quantity in the New England States. Unfortunately shafts made from birch will not stay straight. However when a shaft warps it can be straightened by bending over the heel of the hand. While birch lacks spine in comparison to Port Orford Cedar, its added toughness is a redeeming quality.

Port Orford Cedar, which grows on the Pacific coast is a straight grained soft wood of excellent spine qualities and with proper care shafts made of this wood will remain straight. Any wood subjected to a wide range of changes in humidity and temperature will warp. To straighten shafts made from Port Orford Cedar heat the shaft at the bend over a hot plate or an electric stove. Be careful not to soften the finish on the shaft by applying too much heat and do not under any circumstances use an open flame. Hold the shaft in the left hand and straighten by bending over the base of the left thumb. Use care in bending so as not to injure the shaft.

Norway Pine from the forests adjacent to the Baltic Sea makes an excellent arrow wood. Its spine quality comes from the slow growth of the tree in the climate along the Baltic.

Wood shafted arrows are divided into two main classes; self arrows and footed arrows. Self arrows as the name implies are made from a single piece of wood. The cheaper grades of arrows are all self arrows and the price differential results from the kind of wood used in the shaft and the quality of materials and workmanship used in attaching the feathers which is called fletching.

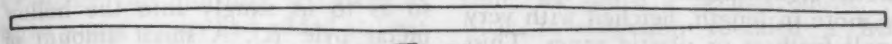


Fig 20

BARRELED ARROW SHAFT (exaggerated taper)

When a hard tough wood is spliced to the head or pyle end of an arrow the shaft is said to be footed. The purpose of footing is to provide added strength and a durable wearing tip or fore-end to the shaft. Woods used for footing are lemonwood, hickory, birch, and purple heart.

Arrows are further classified by their shape. The circular shaft of uniform cross section is the simplest shaft to manufacture and consequently it is the shaft commonly used. It is generally manufactured in the following diameters: one-quarter inch, nine-thirty seconds, five-sixteenths, eleven-thirty seconds, and three-eighths inches. To secure additional spine (stiffness) without a proportional increase in weight throughout the length of the arrow, shafts are tapered at both ends and arrows made from such shafts are called Barrelled Arrows. Figure 20.

Chested arrows have the area of maximum cross section of the shaft below and under the fletching and these arrows taper to the nock and head. Bobtail is the name applied to an arrow whose shaft has its maximum diameter at the head or pyle and tapers uniformally to the nock.

The flight arrow used for distance shooting is a long, light arrow from

Fig 21

twenty-eight inches to thirty inches or more in length, fletched with very small feathers or plastic vanes. Thin bamboo shoots are frequently used because of their strength and light weight to make the shafts of flight arrows.

Seamless metal tubing of both steel and aluminum alloy is used in the manufacture of metal shafted arrows. The metal shafted arrow is unsurpassed for its qualities of uniformity and durability. A set of these arrows matched in weight and spine, custom made, and fletched and crested to the archer's own specifications is a must in the tackle box of the skilled target archer. While the original cost of a dozen of these arrows is high, averaging around twenty-two to twenty-four dollars, with proper care the arrows can be shot season after season and the manufacturer will recondition the arrows at a cost of approximately fifty cents cach.

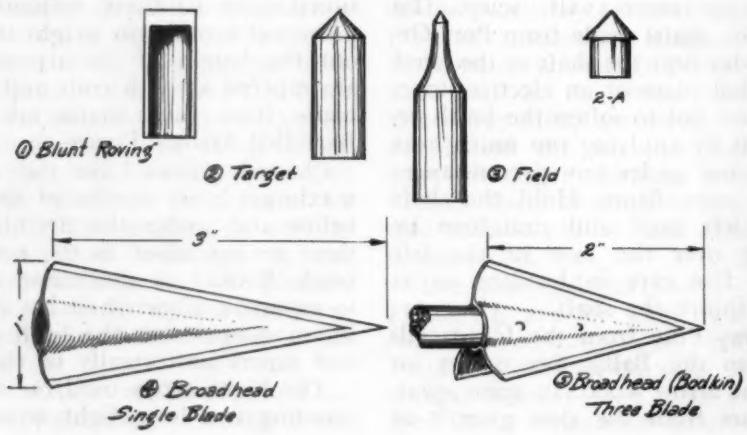
The metal tip attached to the head of the shaft is called the pyle. Its shape varies with the type of shooting for which the arrow is intended. Steel or brass are the metals from which pyles are made. Figure 21 illustrates one method of attaching the pyle to the head of the shaft. The head of the shaft is turned to a smaller cross section (a) and pointed so as to fit snugly into the hollow metal pyle (c). A small amount of Duco household cement applied to the tip of the shaft holds the pyle securely in place.

The illustrations shown in Figure 22 show several types of pyles commonly used and their names are indicative of the use for which they are intended. Numbers 4 and 5 are hunting heads for big game especially. Number 1 is used in small game hunting and has the advantage in squirrel hunting that it is not so liable to penetrate a limb and remain out of reach of the archer. The target pyle, number 2-A, of a metal shafted arrow is pressed into the end of the hollow metal tubing.

Broadheads and field arrows may also be purchased with metal shafts. Due to the high cost compared to wooden shafted arrows and the rugged conditions encountered in the field shooting the majority of field shooters use the wooden shafts.

To Be Continued

Figure 22.



When Wildlife Needs A Friend

By Grace O. Beach

STROLLING lazily through the garden this morning, it looked as if the young plants had added at least an inch to their stature over night. The song birds were flitting to and fro, busily gathering food and material for nests, active little homemakers, chattering and singing as they worked.

Out under the shrubs in the back corner of the garden, we discovered Mrs. Peter Rabbit plucking fur from her breast to line the nest she has dug there. This will be her second family this year and no doubt before long we will all be watching her babies playing tag on the lawn as we did her previous family.

Everywhere nature was fairly bursting her seams to send forth fruit and flowers, seed and cover, and young things to perpetuate the earth and the fullness thereof. The air was fairly static with the rush of activity.

In the midst of all this ambition, your editor seemed to be the only laggard. Either it was contagious, or the ole conscience prodded forth a little matching energy. At any rate we decided that there were jobs that could be done to help things along.

True, we didn't feel much like working, but we cleaned and filled the birdbaths, did a little digging, weeding and fertilizing and decided to tackle the brush that had grown up under the apple tree in the far corner near the edge of the woods. As we snipped away at the outer edges of the rank growth, we had allowed to get under way because of lack of time, we heard a peculiar noise. A little investigation revealed a hen pheasant on her nest, very much excited, but sticking to her job in spite of our intrusion.

Quietly, we retreated and gave up that job. We will have to keep a close watch now so that nothing disturbs her until she can hatch her brood. That job will probably never get done, at least so long as there are pheasants around that might wish to make it their nesting spot. We all spend many pleasant hours watching them at the feeders and picking their way gracefully and cautiously along the shrubs at the back of the garden. We wouldn't trade that pleasure for all the neatly clipped lawns in creation. Fortunately all the neighbors around feel the same way. Our young Junior Izaak Walton Leaguers will help to stand guard and protect the nest.

The spurt of energy was gone now, and we dropped into a lawn chair content to just sit there and let our eyes wander lazily over the landscape. How wonderful everything looked, so fresh, and so many various shades of green which have completely removed the drabness of a few short weeks ago. What a perfect setting for the brilliance of the early blooming tulips, the golden trumpets of the narcissus blowing forth its sweet perfume, and the delft blue of the little woodland flower that carpets the ground beneath them, we mused.

The golden notes of the thrush drifted through the air as a perfect symphonic background, punctuated by the sassy chatter of the wrens perched outside their house in the pin oak. Mrs. Wren raised two families there last year and we hope she will have

as good luck with them this year, we thought drowsily and then apparently drifted off to sleep and into a peculiar dream.

We found ourself lined up with a group of people, all assembled before a man, who seemed to be handing out the orders for the day. One after another, each person got their assignments and finally it came my turn. He looked at me for a time and finally spoke: "You haven't had much experience" he said, "but do the best you can, today you will guard all the little young wild children of nature."

There have been some rugged days, but never one so busy as this, nor an assignment so difficult. Dogs and cats seemed to be everywhere and had to be chased; young boys persisted in climbing trees after nests and had to be gotten down and sent about their business; other boys with guns had to be directed to other activities. There seemed to be always something to disturb the young babies and threaten their lives. The biggest job of all was acting as traffic cop and seeing that these wildlife youngsters were safely escorted across roads and highways. They all were full of adventure and wander-lust. No sooner was one taken care of than another popped into trouble.

About this time two cute little bear cubs chose the middle of the highway to put on a wrestling match, when all of a sudden a car came tearing down the road toward the unsuspecting pair. Every ounce of energy was exerted in an effort to reach the pair before the oncoming car could hit them. Just as we reached them, something startled us out of the sleep and the dream ended. We will never know whether we saved the little fellows and completed our assignment or not. One of lifes little frustrations.

Completely exhausted from our efforts to protect these youngsters and intrigued by the oddity of the dream, we sat there for some time just thinking it over. One thing sure, we wouldn't want the job as a daily routine. There are too many dogs and cats left running loose by their thoughtless owners, and far too many boys and girls that have not been trained to let wildlife babies alone, and give them protection instead of harming them. Then, too, young and old alike are forever carting home little wild babies, through the kindness of their hearts, not realizing that they are doing them harm.

All these things would make the job tough enough, but managing the traffic end of the deal would be a rugged one. Just how rugged can be seen from a recent release of figures sent to the Game Commission by Superintendent Pfeiffer of the Indiana Division of the State Department of Highways. He reports the following wildlife killed by traffic were removed from the highways of that county by his men last year: 2977 rabbits, 128 squirrels, 191 skunks, 46 raccoons, 862 opossums, 44 muskrats, 32 grouse, 6 quail, 139 pheasants and 67 deer, or a total of

4492 wildlife creatures killed by automobile in that one county of the State.

There are 67 counties in the State and using that figure as an average, the toll would run over three hundred thousand birds and animals. That of course does not include those injured that crawled away to die, or were removed by predators.

We thought about the thousands of pounds of valuable wildlife meat, wasted through this careless slaughter. Take the rabbits for instance, their market value is conservatively estimated at $1.20 each. The value of the rabbits alone would figure around $300,000, or the daily bag limit of around 50,000 hunters, in round figures. If you want to figure out the amount of good wholesome meals that might have been enjoyed, one rabbit will provide three average servings.

Modern automobiles are taking a high toll of wildlife and would give any one assigned to the job of acting as wildlife traffic cop a real headache.

With summer coming along, highways will be filled with thousands of people, who will be traveling all over the state to enjoy one kind of recreation or another, or bound for some distant vacation spot.

All the coming new crop of young wildlife, not yet trained to ways of traffic safety or how to avoid dangerous traffic hazards will soon be scampering about in youthful fashion.

The two are bound to meet.

Your Diana is certainly not experienced enough to handle such a situation, as the job dispenser in our dream so ably pointed out, but we can do our share in avoiding disasterous contacts with them in traffic. We can keep a sharp watch when driving, particularly in game country, and by driving with less speed be able to apply the brakes in time to avoid hitting birds and animals and still not endanger human life by slamming on the brakes when traveling at high speed.

We can try to enlist the readers of GAME NEWS to act as their own traffic cops, by doing the same thing, driving safely, cutting down speed and keeping a sharp lookout for wildlife creatures.

If we work together, we can help to cut down the highest toll of death to animals and bird life ever taken on our state highways.

Give wildlife a "Brake" and give yourself a "Break." After all, in driving carefully to save wildlife—"The life you save may be your own."

. . . *The End*

NOTICE OF COMMISSION RESOLUTION

WHEREAS, pursuant to the provisions of Act No. 564, approved January 14, 1952, the Department of Agriculture has given notice to the Pennsylvania Game Commission that the County of Susquehanna is infested with rabies; therefore

RESOLVED, that under the authority of Articles I and V of the Game Law, as amended, protection is hereby removed from raccoons, on the list of game animals, in the County of Susquehanna, as required by said Act, until further notice.

RESOLVED, that notice of the foregoing action shall be duly published in each County affected, in accordance with the provisions of Section 505 of Article V, of the Game Law, and that the Executive Director is hereby authorized and directed to certify the foregoing as a rule and regulation of the Commission.

Thos. D. Frye
Executive Director
Pennsylvania Game Commission

April 16, 1952

The Gun Dog's Bell

By Herbert Kendrick

ANY article of equipment for the gunner or the gun dog which will increase the efficiency and pleasure of a hunt, while at the same time save considerable time and effort, surely merits thorough study and consideration. Our hunting grounds are thick with trees, brush, heavy cover, and our dogs are small enough to be lost from our sight when only a few dozen yards from us, and on the days when footing is damp and the going quiet, it is an impossibility to actually know the position of the fast-moving dog at all times unless he is equipped with a bell on his collar which cheerfully signals his whereabouts. The dog is an important part of a bird searching team and it is very necessary to know where he is when his game is pointed so that the gunner may reach him in the shortest length of time, with the smallest amount of effort or confusion. I have heard of a few animals equipped with sufficient brains and superlative training that enabled them to find game, sneak quietly away, return to his master and lead him back to the quarry, then proceed to repoint. I have never seen a dog perform in

this accomplished manner but I am sure it has been done on rare occasions by dogs possessing almost supernatural abilities, understanding the complete idea of shooting and blessed with a master having time and energy enough to train the dog to accomplish unusual and difficult tasks.

Personally, I would not care to have my dog leave his game to look for me because I feel that if he will cover a reasonable area, find game, successfully handle this game, the least I can do is keep up with him, locate him when he points and honor his find by flushing his game and cleanly killing one bird to reward his efforts.

It is simple and inexpensive to obtain a small sheep bell and attach it to a flat leather collar which can be fastened around your dog's neck the last thing before you release him in the field or woods. Even an older dog who has never worked with a bell will very quickly become accustomed to its sound and in a short time will associate the bell with gunning just as he does hunting clothes, the kennel wagon or the gun.

When the subject of a dog bell is raised, someone invariably advances the theory that a noisy bell clanging with every movement of the dog will surely frighten a wary game bird, thus making it more difficult for the dog to hold. This theory seems normally reasonable to the hunter who has never followed a dog carrying a bell. Many of my gunning companions use bells on their dogs and there are very few times when my own dogs are hunted without a bell and I have never known a game bird to flush from the noise of the bell. In fact, it is reasonable to believe that the tingling, musical sound may at times cause a bird to sit tighter in order to further study the new encroachment on his privacy.

The dog's bell enables the hunter to follow his every move, his rate of speed, and immediately when the sound is hushed, the gunner may make a direct approach to the dog, thus saving time and confused efforts of location. The time saved by a speedy approach may often be enough to get a shot at a wild bird that does not lie too well to a dog's point. The gunner walking in the woods laboring under a distinct fear that his dog may become lost on game, hunts under a handicap which a few cents invested in a bell can overcome. The confident gunner always enjoys more success than the fellow who is constantly afraid and confused.

The most successful use of the sheep bell on a dog is the woodcock and grouse hunting of Dr. Logan Bennett when he hunted with "Pat" in the State College area of Pennsylvania. I never saw Pat in the woods without the useful bell. For many years Doc has been a highly successful gunner, and his advice on training grouse and woodcock dogs can be safely used at all times.

Tom Frye uses a bell for his little cocker "Susie" when he finds time to hunt for grouse. She has learned long ago that the bell means a field trip, and you should see her enthusiastic response when Tom sends her for this useful piece of equipment.

Use a bell on your dog during training trips as well as open season time. Many trainers who are successful follow this rule.

To the beauty of the fields and woodlands the grace and style of fine dogs, the thrilling sport of gunning, add the merry tingle of a dog bell, and you will find another small improvement which will greatly enhance the gloriously thrilling art of shot gunning over bird dogs.

. . . *The End*

The Law of Nature

By L. J. Kopp

WHILE I do not pretend to be an expert on fur management, I do believe that the laws of Nature apply to all wildlife. We have often heard it said that there exists a definite relationship between our soil and our animal life, and that a given area of land can accommodate only so much. We can understand this more readily when we know that the basic wants of animals are food and comfort. When an area of land becomes overcrowded, these major wants can no longer be supplied, and it is then inevitable that the laws of Nature take their course.

This is not only true in animal life, but can be seen in plant and fish life, as well as human life. Down through the ages historians have recorded the rise and fall of empires. The want of food, peace, and comfort can be supplied only by our basic resources, and where these resources are depleted or destroyed, we find that greed develops and Nature takes its course in the form of wars.

We have two alternatives. The laws of Nature have shown throughout the years that we must maintain a balance. To accomplish this we must either harvest the surplus on a given area of land; or we must make the given area of land supply the needs of the growing population, be it animal or human.

Predation, cannibalism, and starvation are some laws of the wild but the various disesases among animals in the wild constitute a more serious challange from Nature. Among these diseases, rabies is probably one of the most dreaded.

During the past twelve years scientific research has firmly established that rabies and other diseases usually break out in areas where the infected species has increased to excessive numbers.

Economic reasons dictate that the most sensible way to maintain a balanced animal population is to harvest the surplus. Therefore in order to safeguard the future and prevent the laws of Nature from taking their course, our goal should be to maintain a balanced population.

In the case of our foxes, we have failed to accomplish this. There are those who would be inclined to attribute our increasing fox population to low fur prices or inadequate bounties, however there are many other contributing factors which are not so well known.

While it is true that financial gain is the prime motive for trapping, it is not the major guiding factor. Actually the number of persons interested in fox trapping has more than doubled during the past ten years. This is partly due to simplified trapping methods, and stepped-up efforts to teach fox trapping. Predator control was recognized long before fur prices dropped, and thus many persons are interested in fox trapping as a tool in wildlife conservation. In addition, fox hunting for sport has gained popularity during the past ten years. But foxes have continued on the increase.

The time was years ago when a farm youth was finished with his education after he passed the eighth grade, and thus he had more time

during the season to become seriously interested in trapping. Trapping and going to school at the same time has its disadvantages, as I know full well. Today a farm youth cannot afford to discontinue his education at such an early date; modern society requires a higher education, and if the farm youth is to adapt himself to modern living standards it is rightly necessary that he continue his education in High School. Even farming requires special training today. From this it can be seen that comparatively few qualified trappers are recruited from the ranks of our farm youths. There is simply not enough time available for a farm youth to become seriously involved in trapping in this fast moving procession.

We have here one of the main reasons for our increased fox population. It is first of all obvious that the majority of farm youths are not guided by fur price, but by available time. Actually any fur price is a gain regardless of the amount, insofar as the farm youth is concerned, and in this case it would seem obvious that even if fur prices where higher the majority of our trappers would not trap any more foxes. It must also be considered that trapping is seasonal, and therefore few persons would be inclined to take trapping seriously when compared to a steady job in some other year round industry.

Lack of serious interest in trapping is due to lack of time, not dictated by fur prices, and as such we have quantity rather than quality. In other words we have more trappers today, but not enough who can qualify as serious trappers.

We must also understand that national emergencies have taken many good trappers from active trapline duty. While many are called to serve our country, both in the Armed Forces, and in other important defense work we would do well to recall that this situation has existed for twelve years or more. Some of our trappers never came home, while many of those who did, never returned to trapping for various reasons.

In addition, some of our better fox trappers have been led away from the trapline by higher wages and easier work in other fields.

Too many trappers today appear to be interested in competing with modern society, rather than follow the trapline. This same principle is true in the entire conservation program. People today no longer go into God's country to find peace and comfort, instead we let ourselves be entertained by such things as television and radio among others. In the meantime our life-giving resources are dwindling away. Our trapping is dwindling away because we are letting ourselves be lured into the modern trend of high wages, less work, and artificial entertainment.

Those trappers who excuse themselves from active trapping with the impression that foxes are not worth trapping merely are not willing to take the bad with the good. It would however be better to trap foxes at four dollars apiece rather than let disease take its course.

It is safe to say that today we have from three to ten foxes where years ago there might have been one or two, or none at all, and for this reason a trapper can still earn a fair wage on the trapline. The only difference today is that it requires more time to compensate for lower prices. Most of our trappers and hunters today are taking all the foxes they possibly can, but unfortunately our trapping population is being thinned out steadily as outlined previously, and it is evident that the younger generation of trappers is not filling the shoes of those who are leaving the trapline.

There is another angle to consider; we have some good fox trappers who for various reasons are not in a position where they can afford to trap

foxes, but here, too, the number of such trappers is very limited and even if fur prices were higher, the trapping which such trappers would in all probability do, would have little effect on our fox population.

Then too, there is the type trapper who insists that he will not trap foxes because of low fur prices or inadequate bounties in spite of the fact that he knows literally nothing whatever about fox trapping. Such a trapper could not trap foxes successfully if he wanted to at twenty dollars apiece, but he makes the mistake of comparing fox trapping to modern high wage trends. Actually fox trapping, or experimenting with the art would be profitable to such a trapper if foxes were not worth a penny. It is almost foolish not to experiment with fox trapping while waiting for higher prices. Fur prices mean nothing if you do not know how to trap, and certainly the experience gained now would be worth more than the loss which one would experience later as a result of lack of trapping knowledge when prices are more worthwhile. Sometimes I think we have more of this type trapper than any other kind. It seems to be easier to say that fur prices are too low than to admit one's ignorance of fox trapping.

From this discussion it can be seen that the reasons for our increasing fox population are as follows:

Modern living standards, educational standards, and our sound economic system, no longer allow sufficient time for serious trapping, whether fur prices are high or not.

Defense work, and war has taken many trappers from active trapline work, and these trappers are not being replaced by the younger trappers.

The modern trend of less work and high wages lures many trappers away from the trapline.

A limited number of trappers are more concerned with high fur prices or higher bounties than with the call of the trapline.

Last, but by no means least, are the trappers who blame low fur prices rather than admit their inability to trap successfully.

In view of these existing circumstances it would seem extremely doubtful that either high fur prices or higher bounties would make any sudden changes in our alltime high fox population. We simply do not have a sufficient number of serious-minded fox trappers.

In addition to what I have already explained we must also consider the fox's cunning. Improperly used fox trapping methods go a long way in educating the fox to avoid traps, and this plays more than a minor role in encouraging an excessive population. The fact that Pennsylvania is ideally suited throughout for fox must also be taken into consideration. Propagation is further encouraged when we recognize that the fox is not limited in natural food supplies, nor is his ability to obtain food limited. This helps the animal to survive the year round, in all weather conditions, and in any locality.

What we need therefore is real determination. We have a challenging problem, not of propagation, but of harvesting the surplus before the laws of Nature do it for us.

. . . *The End.*

WINTER TRAPPING IN THE NORTH COUNTRY

Trapping fur bearers is not the easiest way to make a living *anywhere* in the world, but is particularly difficult, uncomfortable and dangerous in the frozen North Country of Ontario and Quebec. The following account, reprinted from an Ontario Department of Lands and Forests news release, contains numerous notes on the weather, trapping regulations, trapline practices and management, etc., that should be of interest to Pennsylvania trappers.

"Rupert House, James Bay—One thousand miles north of Toronto, 300 miles from the nearest highway, the hardiest men in the country are carrying on their daily occupation of trapping. Each morning they leave crude lean-to's in the bush, step into their snowshoes, harness their dogs, and start out on trips of anything from 15 to 30 miles in temperatures ranging down to 40 below zero. At night they return with their heavily laden sleighs, thaw out the beaver, mink, muskrats they have trapped and start the messy business of cleaning and skinning.

"This is what the country looks like as seen from a low-flying plane of the Ontario Department of Lands and Forests: Ice extends out about 10 miles from the shore of James Bay; beyond that is low ice-fog and open water; to the east, the land is covered sparsely with low evergreens and willows along the river banks; Hannah Bay is cold and inhospitable, covered with ice. The Quebec-Ontario border is a narrow strip ripped through the bush as far as the eye can see; beyond that, the Cabbage Willows River has banks that seem as sharp and straight as those of a canal. And right down the center of this winter highway is one, solitary set of snowshoe tracks. Occasionally they deviate into the banks where the trapper has set his traps. At wider intervals, his overnight lean-to may be spotted from the sky. Sometimes there's a trail of smoke rising into the frosty sky. Three or four husky dogs may be seen tied to the trees or curled up in the snow."

Far down the ice of the bay itself, a cloud of snow indicates that the fur management officer, Tom Tyrer of Moose Factory, may be using his snowmobile to travel up the rough, dangerous trail of the bay, visiting the traplines or the Hudson's Bay posts which are scattered at intervals of roughly one hundred miles from Moose Factory to the Arctic Circle. The snowmobile, a half-track vehicle with skis for steering, is as necessary in this country now as the automobile of the city dweller. No car, however, could operate in the snow here. Tyrer, before starting out on his rounds, makes sure his anti-freeze is a 50-50 mixture of glycol and water, "good" to 50 below zero—a temperature frequently encountered.

He carries full emergency equipment—tent, rifle, explorer's stove, snowshoes, sleeping bag, food. For, despite the sturdiness of the present-day snowmobile, the heavy going does bring mechanical failures at times and he must be prepared to snowshoe anywhere from 50 to 60 miles between posts. Recently, the Lands and Forests Department equipped his machine with a portable short-wave radio capable of two-way communication with the Hudson's Bay Company posts.

Tyrer checks the number of beaver taken under the zoning regulations provided by the Department and adhered to by the Indians. The rule says "one beaver per live house." Usually there are six beaver in a house, a parent pair and four young. One of these young, according to the Indians, almost invariably dies, either from disease or perhaps killed by predators. By taking one animal, good management is ensured. There was a time, before the zoning programme, when trappers were allowed to take only ten beaver. Now they take anywhere up to fifty or more depending on how many houses there are on the trapline. The pelts are sealed, sold at the nearest post and then packed for shipment to England where they are mainly used in the manufacture of felt for fine hats.

Despite their long hours and their lonely, dangerous work, the trappers aren't too highly paid. Beaver prices this year have dropped down to around $23 for the finest pelts. There have been times when they brought as high as $70. Munro Linklater, chief of the Moose band of Indians,

claims that the present prices is so low that it is definitely not worth while. He is presently debating whether to leave his trapline for the season. allowing the beaver to increase still more for next year. But, he says, there's a danger in that. If the beaver increase too heavily, they may flood themselves out of house and home, destroy their own breeding ground, and kill themselves off. He blames no one for this unfortunate state of affairs. He believes the trapline management plans of the Ontario Department of Lands and Forests are excellent, and says so. But he does wish that men and women of North America and of Europe would once again adopt the beaver coat as a symbol of luxury and wealth, so that the demand would increase and prices go up. Last year, his fur catch brought him $2,300 an income he implemented by guiding hunters during the James Bay goose season. This year, so far, he has taken eighteen beaver which brought him about $400.

But, regardless of prices, those solitary snowshoe tracks can still be seen along the Cabbage Willows River.

NATURAL FOODS ATTRACT DUCKS

Pennsylvania duck hunters are becoming increasingly interested in management programs that will improve their sport. They have so far promoted two projects principally—the establishment of new pond or marsh areas and the erection of wood duck nesting boxes.

Just as hunters for other game have learned the relation between ample food supplies and large wildlife populations, duck hunters have come to recognize the need for natural waterfowl foods in quantity. Duck men naturally want the migrants to stop over in this state to raise broods or to tarry here enroute south in the waterfowl season.

To hunters who have asked about the planting of preferred duck foods and where seed may be obtained the following information is offered.

1. Marsh water and soil tests should be made before seed is planted. If duck foods are to be planted on stream or pond banks or mud flats, tests should also be made of the soil there. If such preliminary tests are not made money and effort may be wasted. Some desirable plant species require alkaline soil, while others thrive on acid soil. County Farm Agents will make these soil and water tests for sportsmen.

2. With test results at hand houses selling aquatic seeds will be in position to intelligently recommend plants that will grow under described conditions.

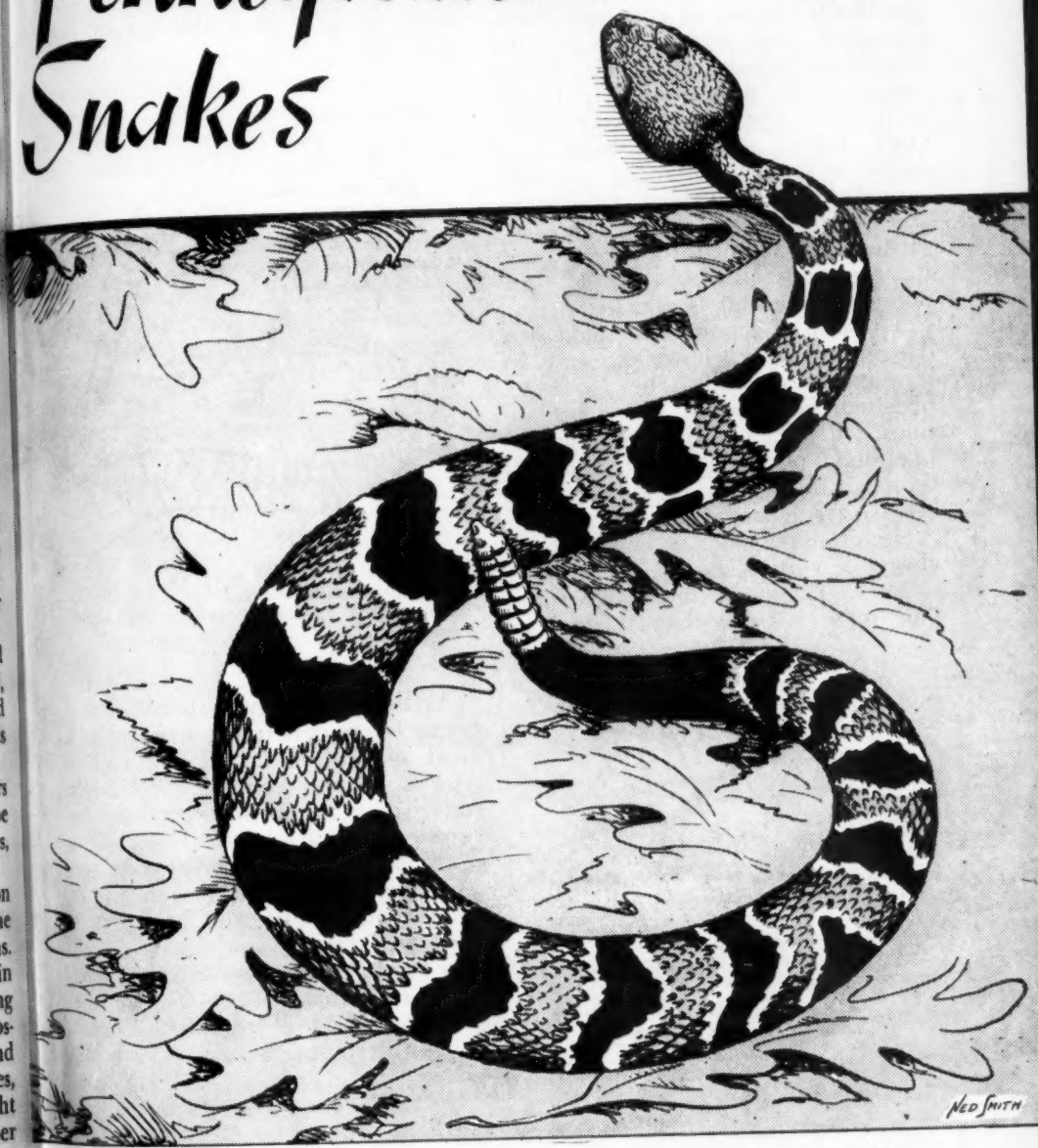
3. Wild rice, wild celery, wild millet, sago pond weed, smartweed, and widgeon-grass are considered some of the better waterfowl foods that may be planted.

4. Names and addresses of dealers who sell aquatic plant seeds may be found in leading outdoor magazines, in which they advertise.

For years, the Game Commission has planted waterfowl foods in the Pymatuning Refuge and marsh areas. With the new duckling program in full swing the agency is expanding its planting program wherever possible, mainly on game lands and other state holdings. In some cases, corn and other grains are bought and left standing in fields near water where ducks stop during fall migration or stay over winter.

Some Pennsylvania Snakes

"Game News"
Conservation
Education
Pamphlet



PENNSYLVANIA GAME COMMISSION
HARRISBURG, PA.

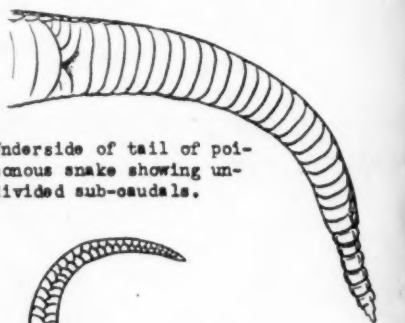
May, 1952

Some Pennsylvania Snakes

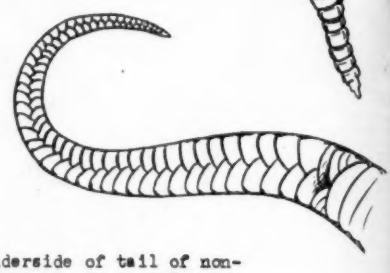
OF all the wild creatures found within the boundaries of our state none are so hated, feared and misunderstood as our snakes. In spite of the fact that most are harmless and practically all are an economic asset, prejudice, superstition and lack of knowledge concerning their habits continue to indiscriminately brand as villains the entire snake tribe. Only three poisonous snakes are found in Pennsylvania—the northern copperhead, the timber rattlesnake and the massasauga, the latter a small rattlesnake confined to the extreme western part of the state. The remainder are harmless to man.

The bite of a poisonous snake is a dangerous thing, however, and its seriousness cannot be overemphasized. Fortunately, a few precautions will practically eliminate the likelihood of being bitten, and will do much to alleviate the anxiety that often mars a trip afield.

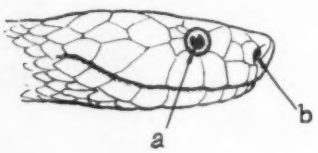
High-topped shoes or boots should always be worn when hiking in snake country. To avoid bites above the shoe tops be particularly careful in stepping down over logs or ledges of rocks where a snake could lie concealed some distance above the ground. When climbing be cautious about reaching for a handhold into nooks and crannies above your line of vision.



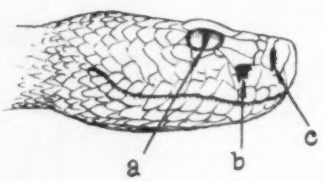
Underside of tail of poisonous snake showing undivided sub-caudals.



Underside of tail of non-poisonous snake showing sub-caudals divided into two rows.



Head of non-poisonous snake showing round pupil (a), nostril (b).



Head of poisonous pit viper showing eliptical pupil (a), pit (b), and nostril (c).

As there is always a possibility of being bitten when far from help a good snake bite kit of the suction type is a great comfort, and might conceivably mean the difference between life and death. However, a snake bite outfit is worthless if you don't have it with you or you do not know how to use it. Make it a standard item of equipment on all your strolls into snake territory, read the instructions and *memorize* the proper method of treatment. Don't wait until you are bitten to learn the technique.

Besides the actual treatment you can help yourself by observing a few simple common-sense rules. The seriousness of a snake bite is generally

proportionate to the amount of venom absorbed by the circulatory system, therefore the flow of poison-laden blood through the body should be retarded and suction applied as quickly as possible. Acceleration of circulation must be avoided, so refrain from all unnecessary exertion, remain as quiet as possible, and do not partake of stimulants of any kind.

Most of the snakes you meet will probably be of the harmless variety. A few of these bite viciously, but with little effect, when handled, and most of them are easily tamed and can hardly be induced to bite.

All poisonous snakes in Pennsylvania belong to the pit viper family, so called from the opening in the side of the head between the eye and the nostril. No non-venomous snakes have this opening. Furthermore. the sub-caudals (the plates on the underside of the tail back of the vent) are divided on our non-poisonous snakes and in a single row on the poisonous ones, except for the extreme terminal portion of the copperhead's tail. The pupil of the eye is another identifying feature. Pit vipers have elliptical pupils while those of our harmless snakes are round.

Only the poisonous snakes have fangs. These are elongated hollow teeth that inject the venom deep in the flesh of the victim. They are normally two in number and are located in the front of the mouth, mounted on movable bones so that they can be erected when desired. When the jaws are closed they lie folded up against the roof of the mouth.

Non-venomous snakes have no fangs, but are equipped with numerous small, needle-sharp, hooked teeth designed merely to hold their struggling prey. Harmless snakes swallow their food alive and kicking; poisonous snakes usually allow the poison to take effect before swallowing their prey, except in the case of the smaller victims.

While not the best loved of our wildlife there's no denying that snakes are an interesting part of Pennsylvania's fauna. The following color photos by Hal H. Harrison, well-known wildlife photographer, and the descriptive captions written by Dr. M. Graham Netting, assistant director of Carnegie Museum, should be of considerable aid in identifying snakes in the field and in helping us to understand the habits and economic importance of our scaly neighbors.

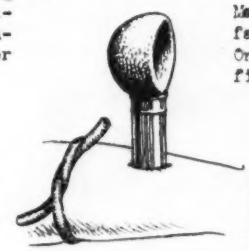
FIRST AID FOR SNAKE BITE

1

Apply tourniquet between fang marks and heart, then sterilize wound and cutting instrument with iodine or other antiseptic.

2

Make two crossed incisions through fang marks at least ¼ inch deep. Only single lengthwise incisions on fingers and toes.



3

Apply suction by means of suction cup or mouth. Moisten edge of suction cup before using.

4

Draw tourniquet only tight enough to retard circulation, not halt it completely. Release tourniquet briefly every ten minutes.

SNAKES ON THIS PAGE ARE POISONOUS

TIMBER RATTLESNAKE—The largest and most dangerous poisonous snake in Pennsylvania, but now common only in sparsely populated mountainous areas. The characteristic black chevron-shaped blotches are superimposed on a sulphur-yellow or blackish back, colors not correlated with sex as often claimed. This snake feeds almost exclusively on warm-blooded prey, chiefly rodents and birds. Each female produces 7 to 12 young every other year, usually in September. Maximum size in Pennsylvania, about 5 feet.

(Not Shown) **EASTERN MASSASAUGA**—The "black snapper" is a small rattlesnake with large plates on top of its head, a central row of squarish blotches down the back and a small rattle. It feeds largely on small mammals and produces 5 to 9 young in late summer. Maximum length, 3½ feet, but most Pennsylvania specimens under 30 inches. This mid-western prairie snake has penetrated only into western Pennsylvania where it occurs in isolated colonies in swamps and fields in Allegheny, Butler, Lawrence, Venango, Mercer and Crawford counties.

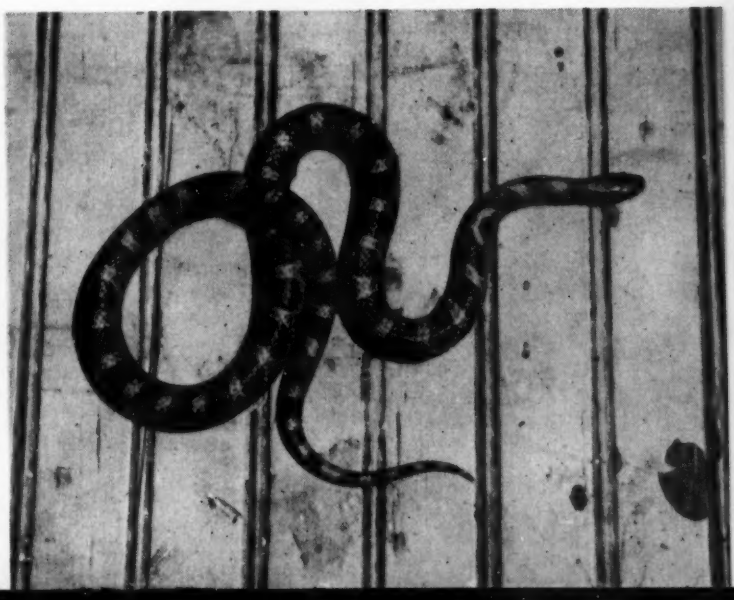
(Left) **NORTHERN COP HEAD**—The copperhead ca instantly recognized by observer calm enough t member that it is the Pennsylvania snake with dish triangles, *with the p up*, along each side of body. Although the comm poisonous snake in the it is retiring and nocturnal causes few accidents. frogs, insects and birds its chief foods. Pennsyl females bear 4 to 9 y from late August to mid- tember. Maximum size in P sylvania, about 42 in average size locally, a 30 inches. Largely absen the glaciated northeast northwest sections.

SNAKES ON THIS AND FOLLOWING PAGES ARE NON-POISONOUS

NORTHERN BANDED WATER SNAKE—This blotched water snake, usually with dark half-moons on the belly scales, is non-poisonous but ill-smelling and bad-tempered. Farmers often call it the "water moccasin," leading bookish city slickers to confuse it with the poisonous cottonmouth of the South. It is unwisely persecuted by fishermen unaware that it feeds primarily on frogs, non-game fish, and dead or diseased fish and that its numerous young (up to 44 in a litter) are relished by bass. Maximum length, 51 inches.

(Not Shown) **QUEEN WATER SNAKE**—Plain brown above except for a yellowish stripe low on each side; 2 brown stripes on the under surface; rarely bites when handled; not detrimental to fish as it feeds almost exclusively on crayfish. Litters of 10 or fewer 8- to 9-inch young are born in August or September. Maximum length, 33 inches. Absent in the higher portions of the State.

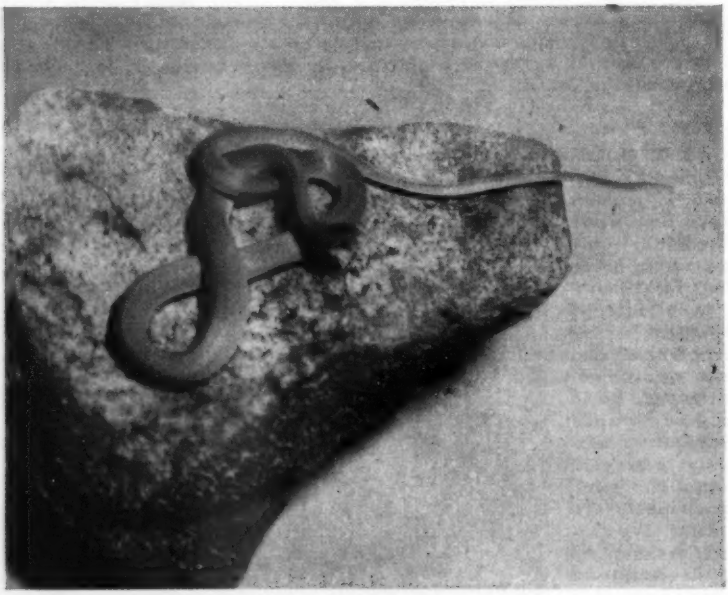
(Right) **UPLAND HOUSE SNAKE**—Waxy smooth, patterned with reddish saddles above and a black and white checkerboard beneath, the rodent- and snake-eating house snake is one of our most beneficial serpents. Unfortunately, it is regularly mistaken for the poisonous copperhead *and* killed, or falsely accused of milking cows *and killed*. Up to two dozen eggs laid in June or July hatch several months later. The brightly patterned hatchlings, too small to manage a large grasshopper, are responsible for most September "copperhead scares" in suburban neighborhoods. Maximum size, 3½ feet.



(Left) **PILOT BLACKSNAKE—This powerful constrictor, the largest Pennsylvania snake, is also called mountain blacksnake, lazy blacksnake, and black rat snake. The last is preferable to the usual common name because it does not pilot rattlesnakes whereas it does feed so heavily on rodents that each specimen is worth at least five dollars to an orchardist or dairyman but is a detriment around a henhouse. Young pilots are blotched; adults may retain traces of the youthful pattern in faint crossbands of white, yellow or red or be uniform shiny black. Maximum length, 8 feet 5 inches but 6-foot specimens now rare.**

(Not shown) **BLACK RACER—Although it resembles the pilot blacksnake the adult racer has smooth, satiny scales and no hint of a pattern on its body. In spite of its misleading technical name (Coluber constrictor constrictor) it does not constrict the mice, frogs, snakes, insects and birds upon which it feeds. It usually escapes rapidly through bushes or on the ground but will fight viciously if cornered. If a courting racer is interrupted it may make a short charge but will not chase the intruder any great distance. One to two dozen eggs, laid in early summer, produce 8 to 12 hatchlings about August. The largest specimen ever recorded, 5 feet 11 inches in length, was caught in Wilkinsburg, many years ago.**

(Below) **EASTERN SMOOTH GREEN SNAKE—This smooth-scaled bright green snake is so protectively colored for life in grass that it often escapes observation. It is extremely gentle but a finicky eater in captivity. Crickets, grasshoppers and other insects are its chief foods. From 3 to 11 eggs, laid in July or August, hatch within a month. Maximum length, 24 inches.**



(Above) **NORTHERN HOG-NOSED SNAKE—The characteristic hissing, neck-spreading and closed-mouth striking of this variably colored snake account for the names "spread-head," "blowing viper," "puff adder" and for the erroneous notion that it is poisonous. Its upturned snout, which makes identification easy, facilitates digging in sand or loose soil. It feeds principally on toads, lays eggs, and sometimes feigns death. Maximum length, 42 inches.**

(Not Shown) **NORTHERN RED-BELLIED SNAKE—Although extremely gentle this tiny snake can "snarl" by rolling up its lips. Some specimens belie their common name by having bellies of shining blue-black instead of some shade of red. A group of pale gray blotches encircling the neck sometimes causes this snake to be confused with the ring-necked snake. Slugs, earthworms and insect larvae are favored foods. Eight or fewer 3½ inch young are born in August or September. Maximum length, 15⅛ inches. Rare or absent in southeastern Pennsylvania, most plentiful in northern or mountainous sections.**

(Right) **NORTHERN RING-NECKED SNAKE—This harmless, smooth-scaled, pencil-thick snake is a uniform slate gray except for the yellow-orange undersurface and neck ring. Sparsely distributed in wooded areas where it eats insects, earthworms, salamanders and frogs. Females lay one to seven 2-inch long eggs in rotten logs in June or July from which 5-inch babies hatch in about 2 months. Maximum length, 21 inches.**

(Left) **DEKAY'S BROW SNAKE—This gentle little snak is marked with a double re of blackish spots bordering central light stripe. It can hid under such small bits of tra that it remains numerous eve in Pittsburgh and Philadelphi It eats slugs, earthworms, sna and insects. From 9 to 2 young, so tiny that 6 can b coiled in a thimble, are bo in August or September. Max mum length, 17¼ inches.**

(Right) **EASTERN RIBBON SNAKE—This marsh-inhabiting relative of the garter snake is readily distinguished by its slenderness and by the brilliance of its pattern; its three longitudinal yellow stripes are always distinct and in sharp contrast to the dark, almost black, back. It feeds upon salamanders, frogs, tadpoles and insects and bears 5 to 20 living young in July or August. Maximum length, 32 inches.**

(Left) **EASTERN GAR SNAKE — Although its th longitudinal yellow stripes often indistinct or obscured a pattern of numerous d spots most persons recogn Pennsylvania's most comm snake. It feeds princip upon earthworms and amp bians. Litters of 14 to young are born in August early September. Maxim size, 3 feet 8 inches.**